SOCIAL SCIENCES

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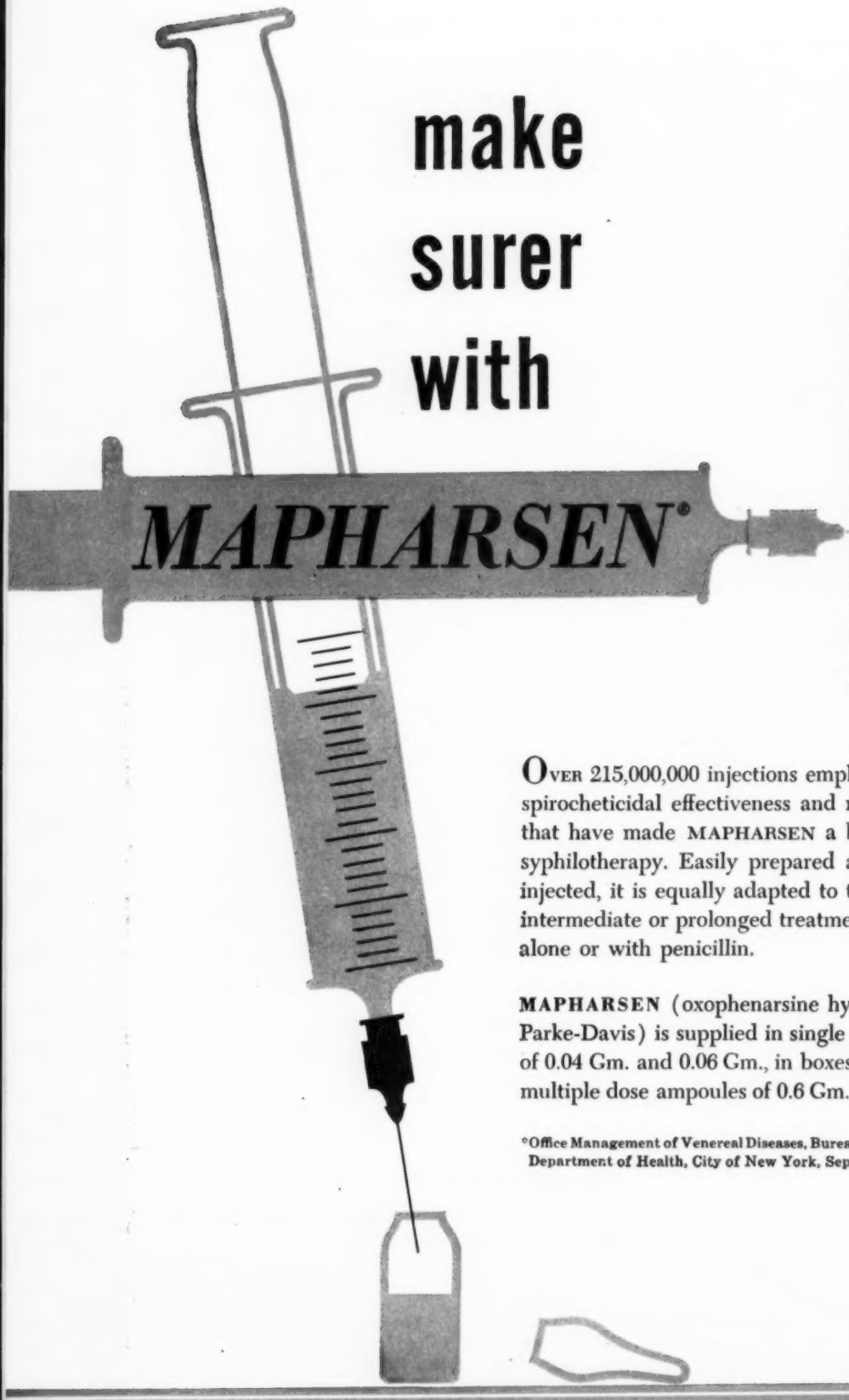

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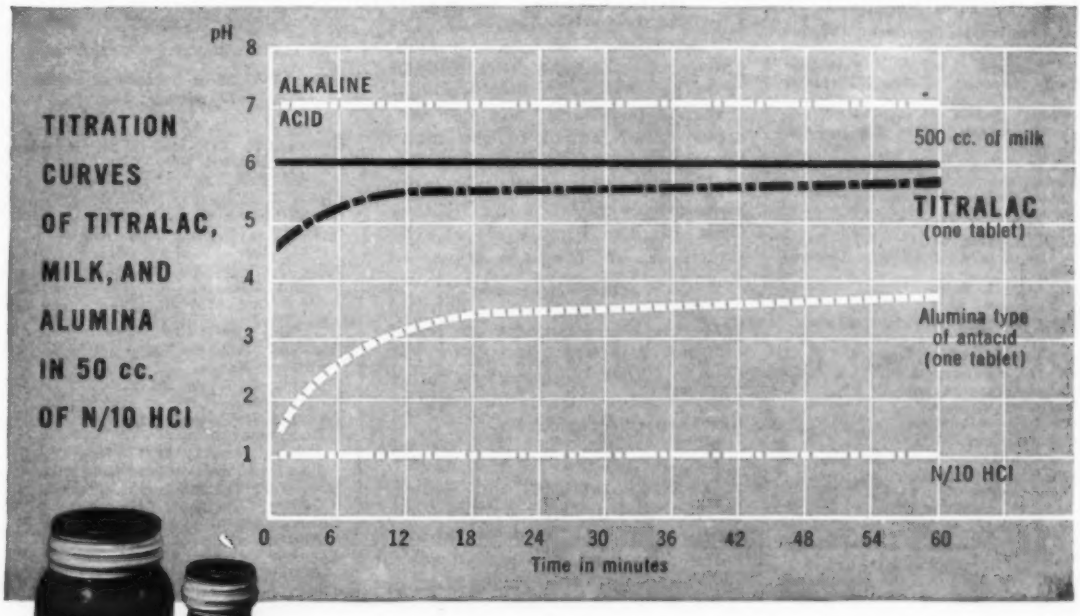

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1. Rossett, N. E., and Flexner, J.: Ann. Int. Med. 18: 193 (1944). 2. Freezer, C. R. E.; Gibson, C. S., and Matthews, E.: Guy's Hosp. Reports 78: 191 (1928). 3. Aaron, A. H.; Lipp, W. F., and Milch, E.: J. A. M. A. 139: 514 (Feb. 19) 1949. 4. Kirsner, J. B., and Palmer, W. L.: Illinois M. J. 94: 357 (Dec.) 1948. 5. Kimball, S.: in Practice of Medicine (Tice). Hagerstown, Md., W. F. Prior Company, Inc., 1948; p. 210. 6. Special Article: M. Times 76: 10 (Jan.) 1948.


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## NEWS

DANIEL L. LYNCH, M.D., Medical Director New England Telephone & Telegraph Company from 1915 until his retirement several years ago, has had another honor added to the many that have been given him during his useful past. At the tenth annual convention of the Military Order of the Purple Heart, Department of Massachusetts, at Boston, June 23-25, he received the highest award the Order can bestow—the Certificate of Merit of the Military Order of the Purple Heart. This was in recognition of his outstanding services to the organization.

H. GLENN GARDINER, M.D., is now associated with the Medical Department of Inland Steel Company. Effective July 1, he became Assistant Medical Director, in charge at the East Chicago Works, East Chicago, Indiana. DR. GARDINER was born at Geary, Oklahoma, in 1910; received his M.D. at the University of Oklahoma School of Medicine, 1935; interned at Columbus Hospital, Chicago; practiced industrial medicine and traumatic surgery, 1936-42; was Medical Director and Chief Surgeon, Foote Bros. Gear & Machine Corporation. Chicago, 1942-44; engaged in industrial medical work at Hammond, Indiana, from 1944 to 1946; and was Medical Director, Sears Roebuck & Company, from 1946 until his recent move to Inland Steel.

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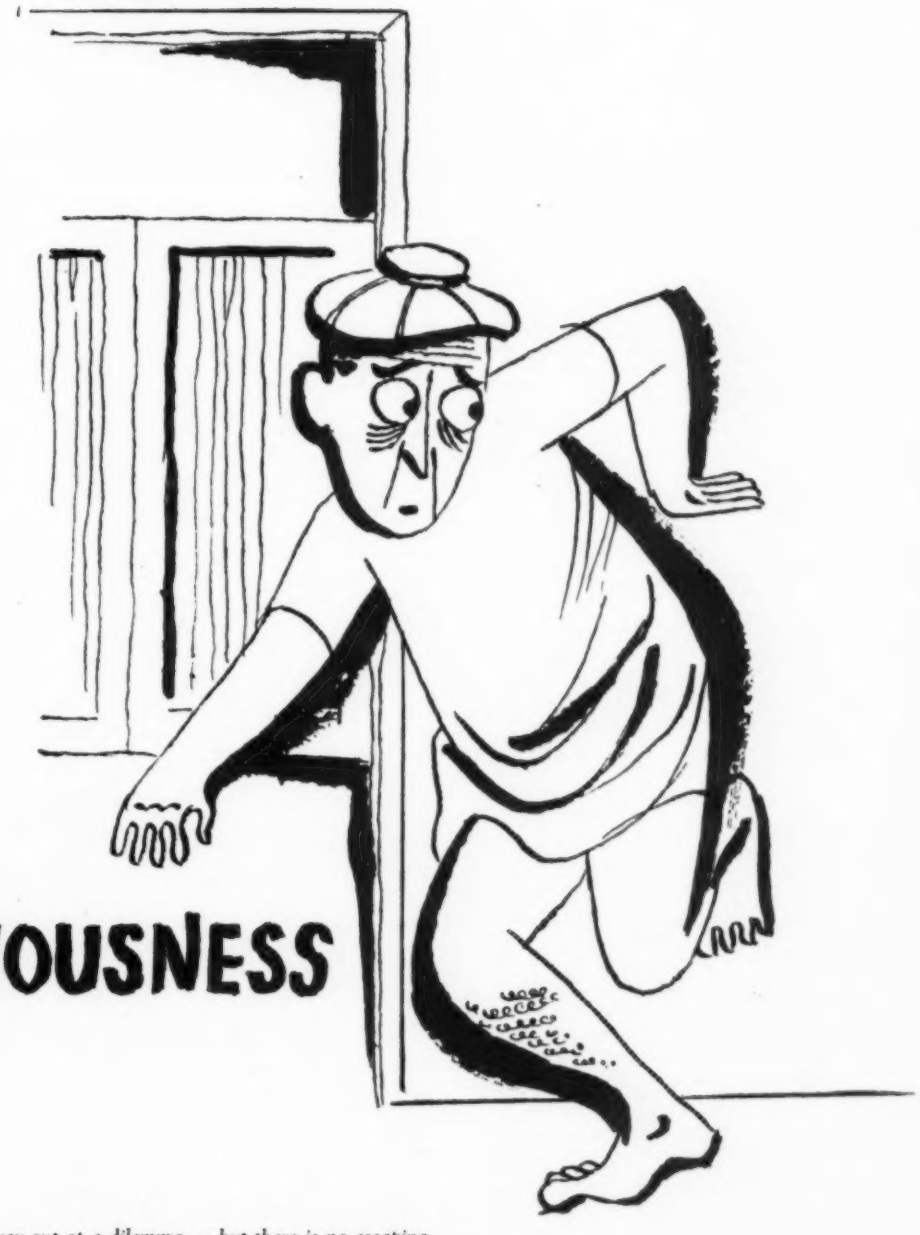

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approved engineering, chemistry or physics schools and who are citizens of the United States.

THE Industrial Health Sections of the Quebec and Ontario Medical Associations will hold a joint meeting at the Hotel General Brock, Niagara Falls, Ontario, Canada, October 11-13, 1950. DR. GORDON A. SINCLAIR, 155 Brooke Ave., Toronto 12, Ontario, is Secretary of the Industrial Health Section of the Ontario Medical Association.

DR. KARL A. MEYER, Medical Director of Cook County institutions, and medical member of Illinois' Governor's civilian defense advisory committee, together was DRS. HARVEY ALLEN, MANUEL LICHENSTEIN, LOUIS RIVERS and SAMUEL HOFFMAN, have recommended that the public be prepared in at least two ways in the event of a major disaster: (1) Every person should have a tetanus inoculation, and every person should know his blood group. (2) Every industry, organization and agency in Chicago should begin immediately to inoculate all their personnel.

—From *Chicago Daily News*, July 22, 1950.

L. L. SEXTON, M.D., for many years a member of the A.A.I.-P. & S. through the TERRITORIAL ASSOCIATION OF PLANTATION PHYSICIANS, has retired after 39 years of plantation work and has moved from Hilo, Hawaii to the La Rhonda Apartments, 103 Natoma Avenue, Santa Barbara, California.

THE Public Health Service, Washington, will shortly make available a general source book on industrial health and medical programs which will include the following sections: (1) General Characteristics of Industry and the Labor Force. (2) The Health Status of Workers and the Extent of Occupational Disease. (3) Industrial Health and Medicine in the U. S. — Historical Development and Present Scope. (4) Organization and Administration of Plant Health and Medical Services. (5) Types and Extent of Plant Health and Medical Services. (6) Professional Personnel in Plant Health and Medical Services. (7) Facilities and Equipment for Plant Health and Medical Services. (8) Costs and Values of Plant Health and Medi-

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## *63rd Annual Meeting, April 3-5, 1951, at the Drake Hotel, Chicago*

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cal Services. (9) General Medical Care Plans for Industrial Workers. (10) Governmental and Other Agency Industrial Health, Medical and Disability Programs.

## Recent Deaths

JAMES EAVES, M.D., 65, at Piedmont, California. DR. EAVES was a member of the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS.

VIRGIL L. CHAMBERS, M.D., 55, Medical Director and Vice-President, Appalachian Life Insurance Company, at Huntington, West Virginia. DR. CHAMBERS was also affiliated with the Chesapeake & Ohio Railway, Wilson & Company, Koppers Company, and Houdaille-Hershey Corporation.

CLARENCE C. BURLINGAME, M.D., F.A.C.P., 65, July 22, 1950, at Leicester, England. DR. BURLINGAME was born at Rockford, Illinois; graduated M.D., General Medical College, Chicago, 1908; took post-graduate courses in New York, Boston, and several universities in Europe, and had specialized in psychiatry for the last 40 years. He was associated with Cheney Brothers, 1915-17, after which he spent several years in the Army. He was a diplomate of the American Board of Psychiatry and Neurology, and was internationally known for his many published articles and treatises on medical and related subjects. For a number of years he was associated with the Institute of Living, Hartford, Connecticut. He was an Honorary Member of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS.

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April 22-24, 1951, Atlantic City

American Industrial Hygiene Association
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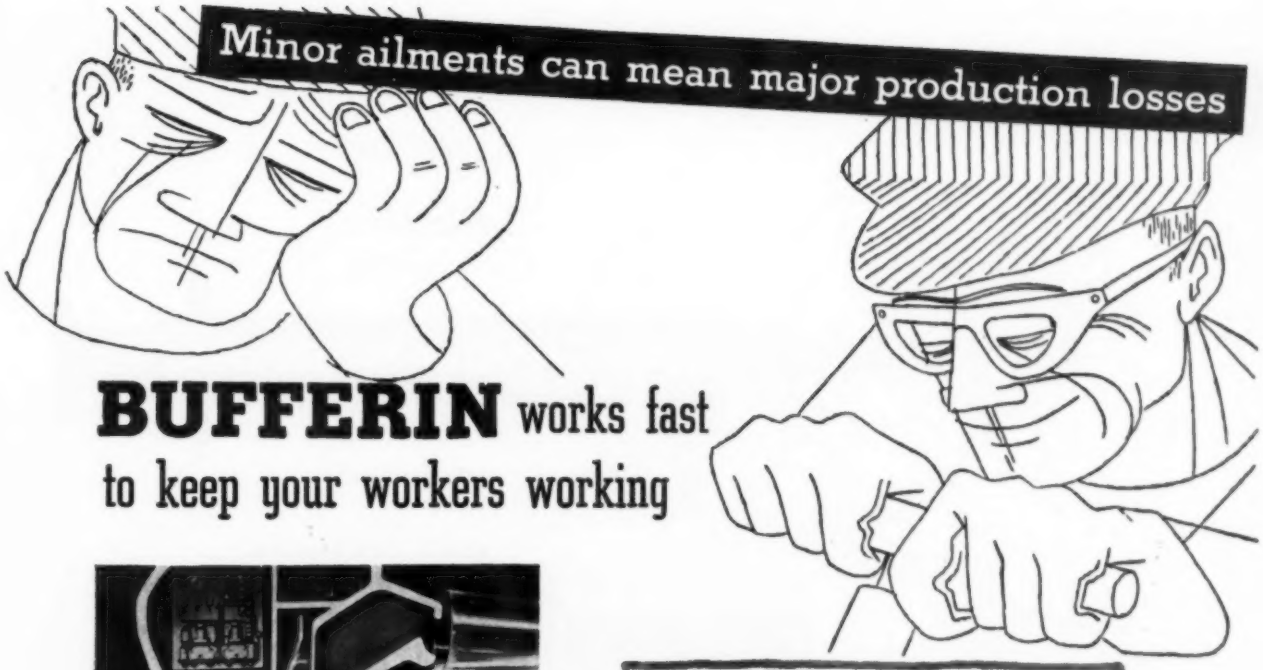
Industrial Hygiene Foundation of America, 4400 Fifth Ave., Pittsburgh 13, Pa. JOHN F. MCMAHON, Managing Director.

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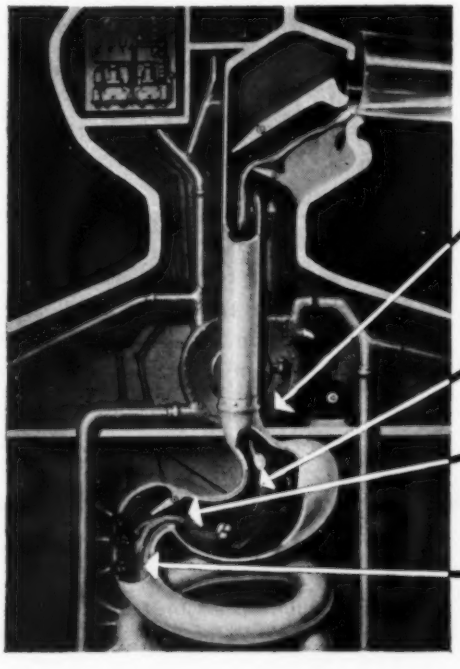

1. BUFFERIN enters the stomach here.
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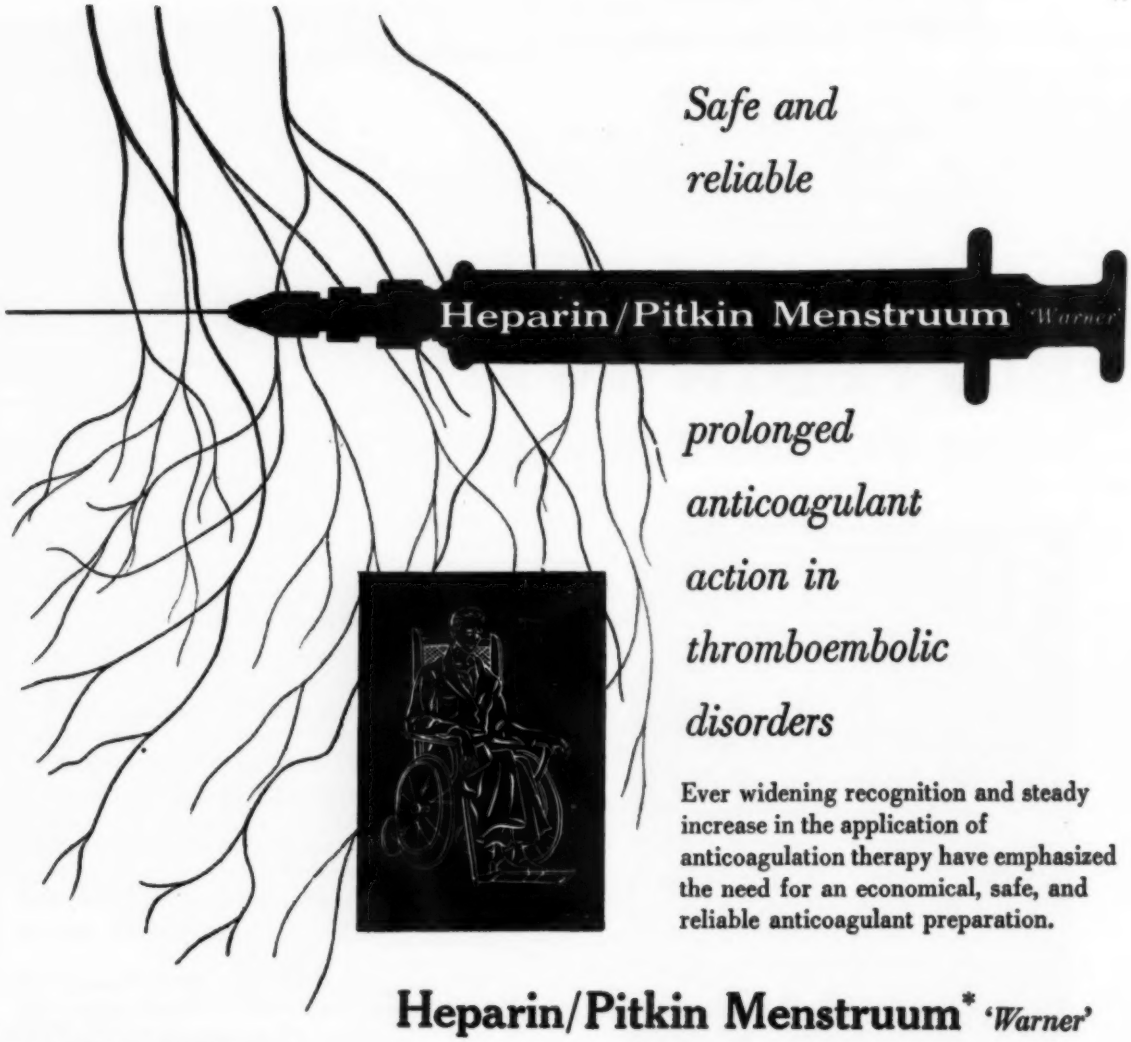


*Safe and reliable*

*prolonged anticoagulant action in thromboembolic disorders*

Ever widening recognition and steady increase in the application of anticoagulation therapy have emphasized the need for an economical, safe, and reliable anticoagulant preparation.

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Cartons, 1 and 6 ampuls each
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*References:* (1) Loewe, L., Hirsch, E., Grayzel, D.M., and Kashdan, F.: Experimental Study of the Comparative Action of Heparin and Dicumarol on the *In Vivo* Clot, *J. Lab. Clin. Med.*, *33*:721, 1948.
(2) Evans, J.A., and Dee, J.F.: Anticoagulant Treatment of Postoperative Venous Thrombosis and Pulmonary Embolism, *New Eng. J. M.*, *238*:1, 1948.

provides the means for prolonged anticoagulation action which affords "... consistently satisfactory results."(1) HEPARIN/PITKIN MENSTRUUM* 'Warner' inaugurated a new era in the preventive and therapeutic use of heparin in thromboembolic disorders, venous and arterial.

Evans and Dee(2) comment that "... the advent of heparin in Pitkin menstruum will popularize anticoagulant therapy as a safe and reliable method of treatment."

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# 8 to 24 hours' relief

## FROM HAY FEVER

● This is not "just another antihistaminic." It's new and different: DI-PARALENE Hydrochloride. DI-PARALENE has a piperazine base instead of the conventional ethylenediamine. Compared with agents heretofore available, it is outstanding in its long duration of action—8 to 24 hours' relief after a single dose.

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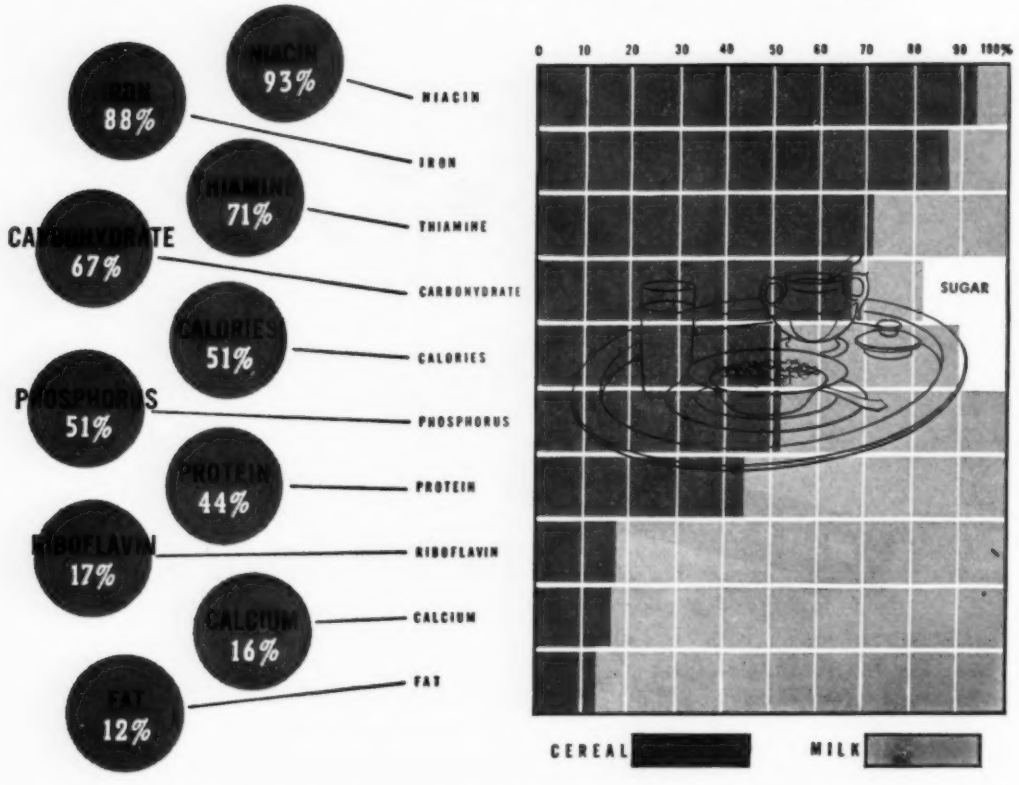


That breakfast cereals make a significant contribution to the over-all nutrient content of the cereal and milk serving consisting of 1 oz. of breakfast cereal, 4 oz. of milk, and 1 teaspoonful of sugar, is readily apparent from the bar chart. In the case of five of the nine nutrients, as well as in calories, the breakfast cereal alone provides more than 50 per cent of the total amounts contributed by both cereal and milk, and almost 50 per cent of the protein. These figures are based on composite averages of all breakfast cereals—whole grain, enriched, or restored to whole grain values of thiamine, niacin and iron.

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1. Wilhelm, S. F.; et al.: J.A.M.A. 141: 837 (Nov. 19) 1949.

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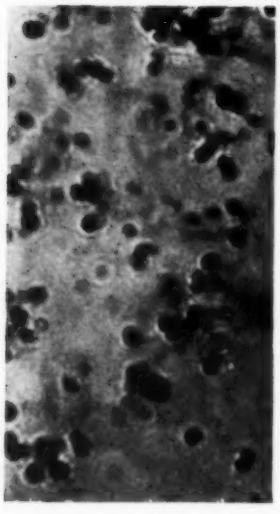
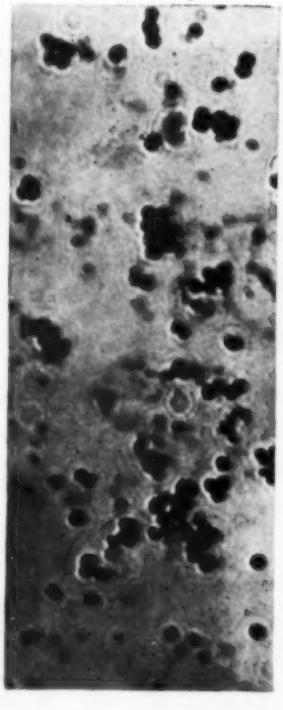


## *Micrococcus flavus for assay...*



Inhibition of the organism's growth was used as an index of bacitracin stability when this practical antibiotic was incorporated in various bases and stored for varying periods under different temperatures. From these studies of Upjohn research workers came the development of Baciguent* Ointment containing 500 units bacitracin per gram for control of superficial infections. Unlike penicillin, bacitracin rarely produces sensitivity and is not inactivated by blood, plasma, pus or necrotic tissue.

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## *Just Make This Simple Test:*

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Take a puff—DON'T INHALE. Just s-l-o-w-l-y let the smoke come through your nose. Easy, isn't it? AND NOW...

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DON'T INHALE. Just take a puff and s-l-o-w-l-y let the smoke come through your nose. Notice that bite, that sting? Quite a difference from PHILIP MORRIS!

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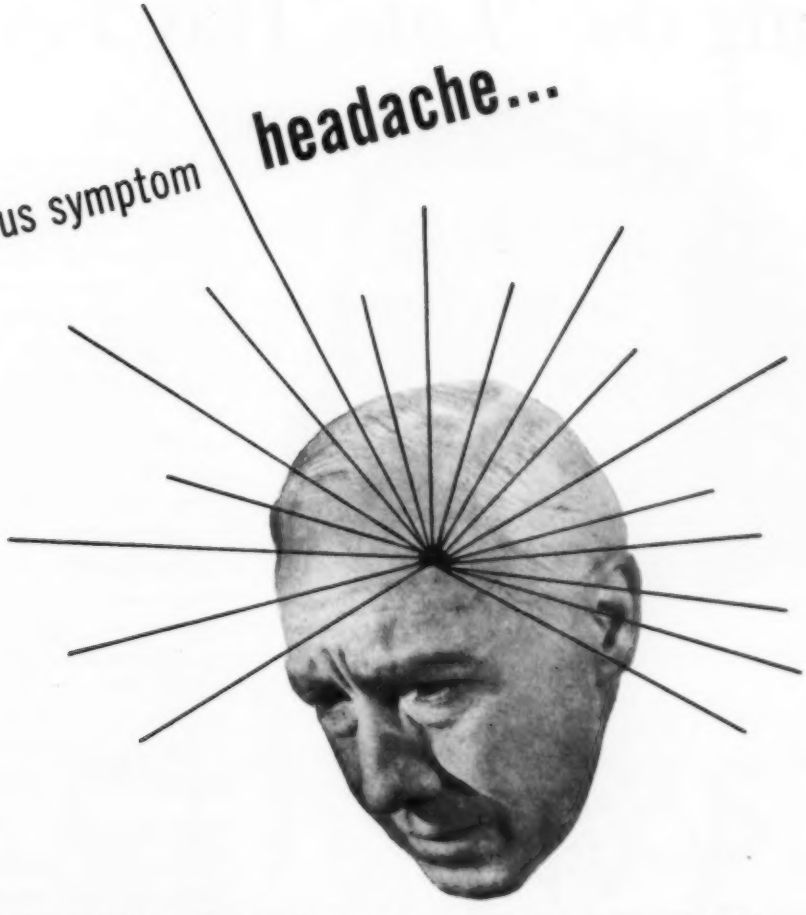
**Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245; N. Y. State Journ. Med., Vol. 35, 6-1-35, No. 11, 590-592; Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154; Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60*

"The ubiquitous symptom **headache...**



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*Minish, L.T., Jr.: Headache, Kentucky M.J. 48:66 (Feb.) 1950

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[1]Cooke, R. A.: *Allergy in Theory and Practice.* Philadelphia: W. B. Saunders Company, 1947, p. 186

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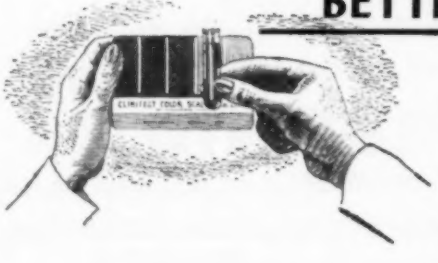

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**Bibliography:** (1) Wilkerson, H. L. C.: New York State J. Med. *49*:2945 (Dec. 15) 1949. (2) Sweeney, J. S.: Texas State J. Med. *45*:623 (Sept.) 1949.

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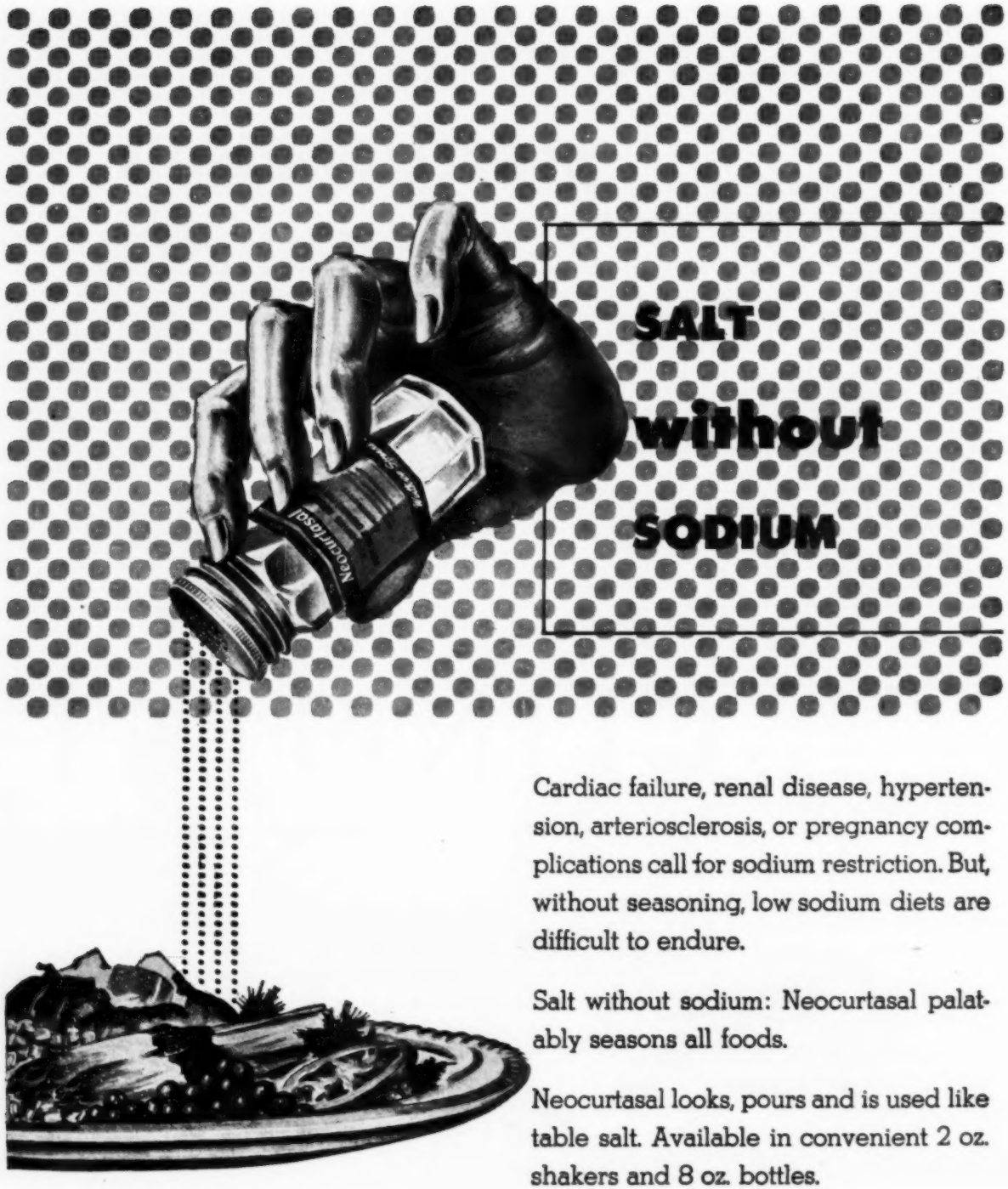


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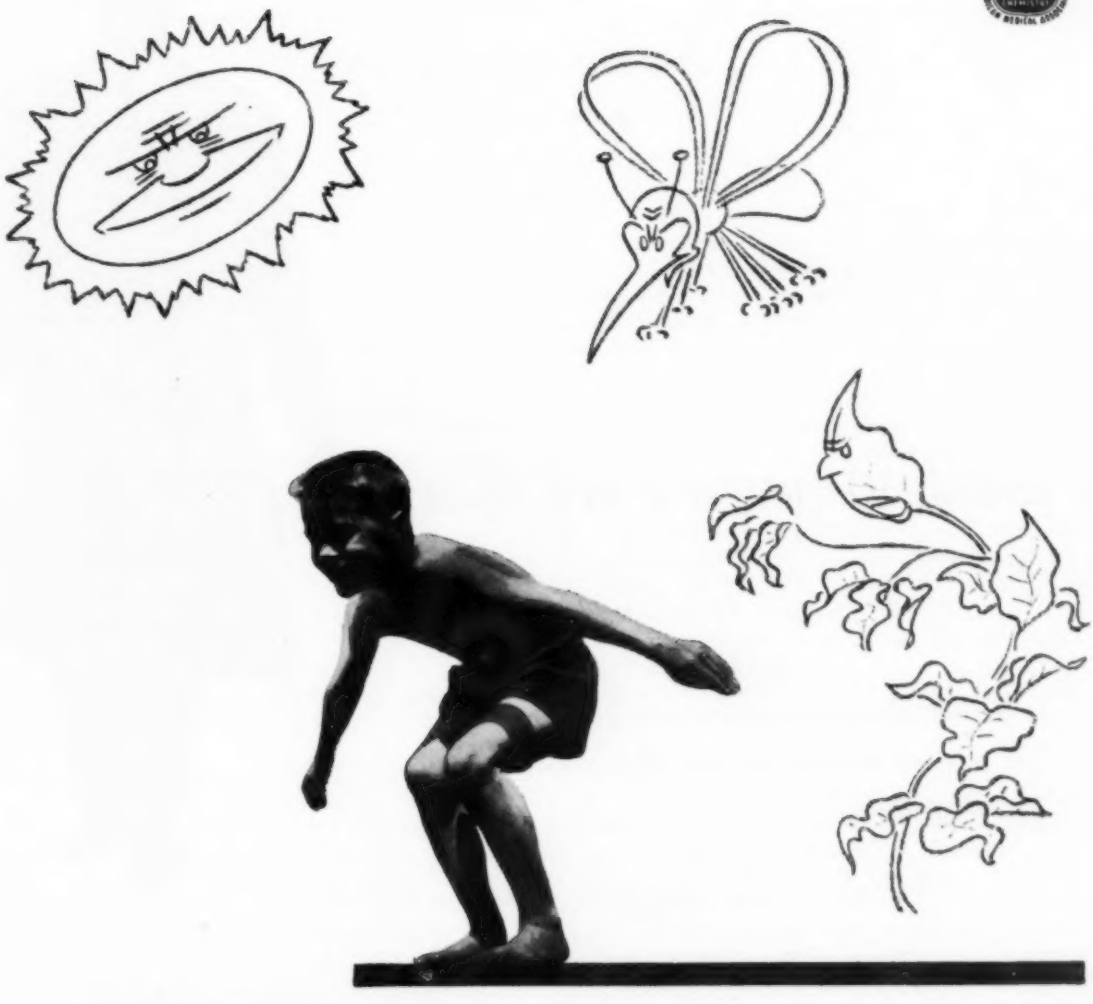

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INDUSTRIAL MEDICINE AND SURGERY

*Volume 19* AUGUST 1950 *Number 8*

# PLANTATION MEDICINE

## The Sugar Industry

NILS P. LARSEN, M.D.,
Honolulu

TEN YEARS ago the president of the Hawaiian Sugar Planters' Association, John E. Russell, wrote that sugar—the principal industry of the Territory of Hawaii—"represents an investment of more than $160,000,000; employs directly approximately 50,000 workers; and more than 101,000 persons, workers and their families, live on the plantations .... In general, each plantation maintains a hospital .... has at least one regularly employed physician, and such nurses and visiting nurses as necessary .... Regular dispensaries for minor ailments are operated daily. Baby and prenatal clinics are in operation .... The service includes all physical ailments regardless of whether they originate as a consequence of employment .... free hospitalization and attention are given each employee's family .... childbirths, tonsil operations, appendectomies and other surgical work, for any member of the family ...."

Ten years later the working force had been cut to 22,000, and the total population to 68,000, but the amount of sugar produced was still about the same. The workers' income had risen to $1.04 an hour; whereas in Cuba it was still 40 cents, so, in order to compete in world markets, the industry had to mechanize more and more.

BY AGREEMENT with the unions the employees now pay a health insurance fee which covers about half the cost of the health work. Management, however, thought well enough of the health system to continue it as it was. Owing to rising costs there has been a tendency to do away with the plantation hospitals and to use nearby community hospitals. There are about 42 doctors employed and about 80 trained nurses, as well as many assistant health personnel. Almost 100% of the plantation mothers have their babies delivered in a hospital. The health results of 1949 compared with 1939 indicate that the health level of these rural workers—mostly Orientals in whose homelands the health records are almost as bad as they were a hundred years ago—is better than that of any comparable rural area in the world.

The uniqueness of the system lies in the fact that the plantation doctor is also the family doctor as well as the community health officer and the private doctor for non-plantation people living in the neighborhood. This system grew on the plantations owing to their isolation—when the roads were bad, and when no other doctors were available. As the community developed and outside private doctors settled in the neighborhood, the system continued so that there is very little of private doctors' feeling that company doctors are encroaching on their territory. If anyone were to complain, it really should be in the reverse. However, the local doctors and the plantation doctors get along harmoniously.

AT THE organizational meeting of plantation physicians on June 5, 1942, their purpose was defined as "to improve the quality of plantation medicine." This year's meeting on Maui definitely indicated that the spirit of the original group has continued.

Also unique in the health work on the plantations has been regular contact with the tuberculosis specialists of each island who review all chest x-rays which are taken on every questionable case, and tuberculosis sanitaria for any positive case; regular psychiatric and orthopedic clinics conducted by specialists from Honolulu; a policy of paying old age pensions; more than 100,000 fruit trees available to the laborers, planted in and between their yards, and vegetable gardens in most yards; a system of recreation with gymnasium, swimming pools and playgrounds available to workers and their families and maintained by the plantations; a close contact by the doctors and nurses with the health system of the schools and a close tie-up with the Board of Health and its nurses; a system of monthly reports to a central headquarters in Honolulu of every day's illness, and a yearly analysis of each plantation, comparing its records with the record of the total plantation group.

Since the health record in Hawaii at the beginning of the century was as bad as that of the Orient, this health development in a large rural industry, we believe, well illustrates the fact that a good health system in any industry is not only a great asset to that industry, but also to the community in which it is located. This is indicated by the fact that the health improvement over the years in each condition studied was always seen first among the plantation groups. In those groups the health records were always superior to those of the non-plantation

people. This is one of the few places in America where the rural health records have been consistently superior to the urban records.

The climate is subtropical. The average temperature is plus and minus 74°, with summer and winter varying about 3°. Cool trade winds blow 80% of the time and south winds 20%. The rainfall varies on the plantations from 20 to 150 inches. There are more days in the human comfort zone than found anywhere else in the U.S. The people live on 27 plantations, most of them in small villages and scattered widely over four islands, but on each island connected by excellent roads, and the islands are connected by frequent plane service, also by ships. The people racially are about half and half Japanese and Filipino, with less than 5% Portuguese, Chinese, Korean, European and Hawaiian—the latter two, less than 2%.

(1133 Punchbowl St.)

Upper left: Plantation village—cane fields in the distance. Upper right: Sugar mill and village, Wailuku, Maui. Center: Mechanization on the Islands—machine planting, fertilization and covering. Lower left: The machine age replaces hand harvesting. Lower right: Burning of the cane an assist in harvesting

# Plantation Medicine — Past, Present, and Future

WM. B. PATTERSON, M.D.,
Wailuku, Maui

WHEN I was selected your president at the annual meeting last year, I did not realize what was in store for me. I had thought that my duties would consist of merely conducting this meeting on Maui—that is, that I would be in charge of local arrangements with DR. LARSEN selecting speakers and organizing the program. I had never dreamed of being sent to Detroit to the annual meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS as your representative. Nor had I dreamed that DR. LARSEN would answer my queries about his plans for our next annual meeting by saying that everything was up to me. He did suggest that I keep my eyes open for possible guest speakers for our annual meeting and that I try to persuade DR. HOLMBLAD to come to Hawaii to visit us this year. Well, that is just what I did. I talked with several outstanding speakers at the Detroit meeting who were interested in visiting the Islands. Then when I came back DR. LARSEN and I decided whom we would invite from the Mainland and locally and when they accepted we went to work to organize a program. The program which you have is not the work of any one man nor of the Executive Committee alone but was formed after suggestions were made by our guest speakers and by many members. I think we have a program that will prove interesting, instructive and beneficial to us as industrial physicians and to the organizations we represent.

OUR program is patterned after that of the annual meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS though it can not be as extensive. The meeting in Detroit was truly a "Congress on Industrial Health." Nurses, dentists, industrial hygienists and engineers and industrial physicians from all parts of the United States and several foreign countries were gathered together to study and learn how better to care for men and women in industry. It was indeed an honor to have been sent there as your representative and to have had the privilege of meeting practically all the outstanding industrial medical men in the country. To be there made one realize that organized industrial medicine is very likely soon to become the largest of all medical specialties.

Everywhere one can see that employers are becoming more interested in the health and happiness of their employees. They have found it good business to provide good medical care for their employees while at work. This "medical care at work" no longer consists of just giving first aid and treating industrial accidents but includes many other things such as pre-employment examinations to determine an employee's ability to work, eye screening to determine which employees need glasses, protective goggles for work hazardous to the eyes, periodic physical examinations and many more. All these things protect the employee as well as the employer. By having the proper employee at the proper work, less accidents happen and more work is done. The employee feels that he is being protected from injuries and his morale and efficiency are improved.

This type of industrial medicine is well established and all industries of any appreciable size have medical departments. Some employers have gone farther in their medical programs. They have seen that their employees fail to save money to tide themselves over long non-industrial illnesses. They have encouraged them to take out medical insurance to pay for doctor and hospital bills and in many instances the employers have paid part of this themselves. The employers have also established sick benefits for sick employees so that the employee's family can live through an ordinary illness without financial strain.

AT THE same time a few other industries scattered over the country have launched a different type of medical program to give their employees and sometimes employees' dependents complete medical care. They have done this by employing doctors to treat all the employees and their dependents in a clinic type of arrangement. Where there are many employees and dependents to be treated, specialists can be hired so that the employees will receive as good and complete medical care as is available anywhere. This type of medical care is much cheaper than the private physician type though it does not contain the luxuries of medical care that some patients demand. In many localities private physician care is so expensive that the low income employee feels that he can not afford to pay for it. Therefore, he is glad to join any medical plan that will give him what he considers good medical care at a price that he can afford to pay even though he has to give up such luxuries as house calls and unlimited choice of physicians. Actually the low income employees often receive better medical care by joining such a medical plan because they get specialist care in serious illnesses. There is no doubt that this type of medical care can be successful, as it has already proved to be in many industries. The doctors are hired by the employers and their work must be acceptable to both the employers and the employees. The employees join such a medical plan voluntarily and can withdraw voluntarily. Labor unions have even gone so far as to set up similar medical schemes and these are apparently successful too.

OUR plantation medicine in Hawaii is such a medical scheme as this at the present time but we have a background that none of the other industries has. Over 50 years ago plantation management saw the need for good medical care and provided it. Good doctors were employed who were allowed to do part-time private practice. This part-time private practice kept the doctor ever conscious of his responsibility to the patient and prevented him from losing sight of the important physician-patient relationship in all of his practice. Hospitals were built that have been kept up to date. Field nurses were employed to help the doctors and to go into the homes to teach good health habits and sanitation; nutrition was taught in the schools; good dairy milk was provided at cost; and employees were taught to raise vegetables and fruits in home gardens. Everyone in the community became health conscious. All of this medical care and health education was provided by management without cost to the employee. Accurate health statistics covering a period of 25 years now show that this type of medical program has produced the healthiest rural population of any place in the world where statistics have been kept.

With changing times, labor unions came in and forced the plantations to abandon their system of perquisites including the plan of medical care. However, the employees liked the plantation system of medicine with its full coverage for doctor and hospital and asked that it be retained. Plantation management was convinced that plantation medicine was good business and was willing to help subsidize it. The "Plantation Medical Plan" form of voluntary pre-payment insurance was developed in which there is full coverage for doctor and hospital care by the existing plantation medical facilities. Management subsidizes this plan as much as 50% on some plantations. About 95% of the employees subscribe to the Plantation Medical Plan for themselves and their dependents.

With the background that plantation medicine has of over 50 years of good medical care to the community and with the present day status of producing the healthiest rural population in the world, what can plantation medicine expect of the future? As you all know there are sinister forces at work throughout the world that would destroy not only our system of plantation medicine but the whole system of the private practice of medicine. Medical science has reached the highest level of all times in the United States and it has done this through the system of private practice with the physician responsible directly to the patient. Plantation medicine goes even further than this in that the physician must not only satisfy the patient but is also responsible to management. He must be doubly sure that he practices good medicine.

Labor union leaders have stated that they have a better type of medical program to give the plantation employees than our Plantation Medical Plan. Just what this is I do not know but I can imagine. I do know that the labor union leaders did not consult the H.S.P.A. about the statistics on plantation health before making such a statement. It seems that this is another example of how the labor leaders want to get complete control of the lives of the employees even though it would be to the employees' detriment. No other form of medical care has produced such a healthy population as our plantation medical program, and it has done this economically.

There are potent forces at work throughout our country and particularly in the Federal government which are trying to force socialized medicine on the doctors and the people. This is the first step towards a police state in which the doctors and everyone else are subservient to the state. Then the doctors will be working for the state and the patient will get whatever medical care some government employee decides that he needs according to government regulations. We all know that under such a system the quality of medical care will deteriorate, as this system has been tried in several foreign countries. It is absolutely necessary if the quality of medical care is to remain good that the present doctor-patient relationship be maintained. Also the cost of proposed government socialized medicine would be so much that our taxes would be more than doubled. Socialized medicine would cost many times more than our present system of medicine and then not be half as good.

With all these facts facing us and with the time drawing nearer and nearer when a decision is going to be made whether we are to have socialized medicine, what can we as plantation doctors do to preserve our present system of medicine?

I THINK we as plantation doctors have a wonderful opportunity to defeat socialized medicine in our communities. We are giving complete medical care to the entire community in facilities provided by the plantations. If we give good medical care to the people at a reasonable cost, then when the time comes to vote for socialized medicine or its candidates at the polls the people will not vote for them. To achieve this we will have constantly to prove to the people that our system of medicine is infinitely better and cheaper than government socialized medicine. This is not easy to do and should not be considered lightly. Politicians and socializers are busy with great promises, and the low income employee will believe whatever sounds best to him. We can not rely on promises. We must constantly show the people that our system is best by the type of medical care we give them, and must remind them at the proper time of the type of care they would receive under government medicine. This is the only way that socialized medicine can be beaten. If we allow the socializers to outsmart us, our system of plantation medicine may well serve as an example to the

large industries on the Mainland where there is said to be need for better medical care among some groups.

Our task is not an easy one. It has been shown that in any medical program where unlimited care is offered, about 85% of the complaints will come from about 30% of the people. The incidence of somatic disease in this 30% will be about the same as in the remaining 70% but the 30% will complain bitterly of every imaginable ailment as long as they do not have to pay for their visits to the doctor. Plantation medicine can not furnish a physician's time to sit and talk with every patient for 15 to 20 minutes to assure him that his neurotic complaint is not a sign of disease. If this were done the number of physicians would have to be doubled and the cost would soon approach that of the private physician type of practice. The plantation doctor must be a master diagnostician. He must be able to talk with a patient a short while and decide if he has somatic disease and needs further questioning and examination or if he only needs a little aspirin to relieve his pain. He must learn how to interpret what his patients tell him, and many of these patients can talk only pidgin English. Patients of our many different races will put entirely different meanings on signs and symptoms of disease and it is up to the plantation doctor to know these peculiarities. The plantation doctor must still please every patient and send him away convinced that all is being done for him that is necessary for his rapid recovery. If he does not he will soon hear from management that some patient has been dissatisfied and has complained about the treatment he received.

So, the plantation doctor's task is not an easy one. In the past he has worked hard and has done a good job. In the future he must work even harder to prove to his patients that they are receiving the best type of medical care in the world and that no form of government medicine can give such good care. The future holds a great challenge for the plantation doctor. Let us meet it triumphantly.

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## Plantation Medical Plan

A. L. DEAN, M.D.,
Chairman, Plantation Health and Sanitation Committee

ALTHOUGH the 1946 settlement with I.L.W.U. provided an increase in base wages in lieu of perquisites theretofore provided, it has worked out that the medical plan dues cover about one half the cost of the services rendered. Those in charge of industrial relations have deemed it impractical to change the schedule of dues.

The study made by Drs. Sinai and Peterson in 1947 showed that the system which had developed in our sugar industry is highly efficient in terms of health. The means employed to render services varied widely from plantation to plantation and the costs showed no uniformity. A unified plan which would put the medical and hospital services of all plantations in one organization was proposed. Criticism came from two sources. Those with low hospital costs, because they used public hospitals, foresaw higher costs; at least one plantation with high costs did not want to make any change for fear its high standard of service would be lowered.

A study made by the Plantation Health and Sanitation Committee in 1949 confirmed the results obtained in 1947 with respect to the wide variations in costs between plantations. Strictly comparable cost data are unobtainable at present because of variations in accounting procedures of plantations. Nevertheless the average figure of $2.50 per month for each person enrolled in the medical plan is very close to the cost figure arrived at in the Sinai-Peterson study.

Experts agree that services of the scope and quality now furnished can be provided more efficiently and economically by the system now in effect than by any other which can be proposed. There is one important exception to that generalization. Hospital costs can be reduced and services improved by replacing small plantation hospitals by larger consolidated hospitals.

The possibilities appear to be:

1. Change to an indemnity plan provided by an insurance company;

2. Employ the Hawaii Medical Service Association to handle health insurance on the sugar plantations;

3. Continue the basic features of the present plan whereby medical and surgical services are rendered by salaried physicians assisted by nursing staffs, using dispensary and emergency facilities of the plantations, and hospital facilities on the plantations or at community hospitals.

For dollars spent, No. 3 will give the best returns in health. Where the dollars come from is a matter of industrial relations and plantation finances, with one qualification. The dues must not be set so high that they operate as a bar to joining the plan. For best results all of the plantation population should be enrolled.

## Panel on Fractures

MODERATOR: LEONARD J. GOLDWATER, M.D.: *Recent Trends in Established and Accepted Fracture Treatment Methods:*

IVAR J. LARSEN, M.D., stressed the importance of the nutrition of the patient in bone healing. The idea that a bone heals with adequate calcium supply alone is obsolete. Bone matrix is made up primarily of protein and new bone; osteoid and osseous tissue development is dependent on proper protein and electrolytic balance to a much greater degree than on calcium excess. The calcium needs of the body are easily met and an excess is excreted from the body rather than concentrated at the fracture site. With trauma and subsequent anesthesia it is now appreciated that protein balance is easily upset, and if early healing in fractures is our objective the protein balance must rapidly be restored and maintained. Prolonged immobilization necessary in certain fractures in the past was synonymous with decubitus ulcers and general debility. Proper care, particularly in protein requirements, has helped to eliminate this dreaded complication. Adequate use of blood and blood derivatives, supplementary vitamin therapy and electrolytic replacement are as much a part of fracture treatment today as the setting of bone.

Today, the orthopedist or surgeon treating fractures is aiming toward complete restoration of function or rehabilitation from the day the fracture is sustained, and efforts are directed toward early mobilization and muscle re-education. The fracture patient is no longer a forgotten entity in a corner of the ward who needs no treatment until time for cast removal; nor is he discharged from treatment when the x-ray shows adequate callus, regardless of his function or wage-earning capacities. It is the obligation of the surgeon to see to it that he is functionally able to do his old job or be rehabilitated to a new one in the shortest time.

With emphasis on early healing and early ambulation there has been a trend toward more frequent open reductions for internal fixation and splinting. This has been true in fractures of the long bones and particularly in weight-bearing bones. Replacement of prolonged traction methods in fractures of the femur and tibia by open reduction with screw fixation, plating or intramedullary nailing has contributed much toward early mobilization and early, complete return of knee and foot function. Indications are that operative intervention in many instances destroys the blood clot so important in callus formation and secure bone healing is prolonged. Partly because of this and partly in an effort to speed up healing time, primary bone grafting is being done in many of the larger centers, especially where bone banks are available and grafts can be secured without added surgical trauma to the patient.

During the past decade there has been a definite trend toward more frequent open reductions of fractures in and about the ankle. This has developed partly because of poor functional results and partly in an effort to obtain early mobilization and rapid return to complete and painless function. Open reduction is justifiable because fracture-disclocation of the tibia, fibula and astragalus must be accurately reduced and maintained in order to obtain adequate functional results. Complete reduction and maintenance are not always possible with closed methods.

Three objectives are sought in reduction of ankle fractures:

1. Accurate restoration of tibial and fibular articular surfaces.
2. Restoration of normal weight-bearing alignment.
3. Stability of fracture fragments and joint mortise.

Stability of the ankle joint is dependent on both bony and ligamentous support. The medial and lateral malleoli and the posterior lip of the tibia supply the bony stability. The interosseous tibiofibular, the deltoid, the posterior tibio-talar and tibiocalcaneal, and the calcaneo-fibular and talofibular ligaments offer the ligamentous support. All must be adequately healed for good ankle stability.

A series of 23 slides illustrated the different principles, as well as the importance of getting a firm mortise by the use of screws, and the necessity of getting certain fragments properly lined up and to show that that would have been impossible without metal fixation.

Conclusions: (1) An accurate knowledge of the normal anatomy is essential in treatment of ankle fractures.

2. Accurate restoration of articular surfaces and firm ankle joint stability are prerequisites for early functional recovery following ankle fractures.

3. Restoration of ligamentous support is an integral part of treatment in ankle fractures.

4. The simplest operative procedure possible is justifiable and frequently essential if complete and early function are to be obtained, when the above criteria are not met by manipulative treatment.

### Adequate X-Ray Study After Injury

EDWARD C. HOLMBLAD, M.D., indicated the necessity of adequate x-ray study in industrial medicine and surgery. X-rays must be taken promptly. We cannot afford to miss a fracture. The reason is that we are being checked by the employer, the family and/or the union as well as the industrial commission. It is also important from the medical-legal angle, as in malpractice suits.

If we find any kind of pathology in any of the x-rays we need not be criticized for taking too many pictures. The 75% that are negative are

valuable negative evidence. Of course, the demonstration of pre-existing pathology is important in establishing the age of the fracture. Also of medical-legal importance is public liability, and in this field x-rays can not be over-emphasized.

In a fracture it is well to x-ray the opposite, normal limb—for example, a shoulder, elbow, wrist, etc.

Sometimes the history of an injury will supply a special indication for x-ray study. Where we have a patient falling down an elevator shaft or getting a skull fracture, it is smart to have an x-ray made of the cervical and dorsal spine. In automobile accidents where three persons are in the back seat, the person in the middle most frequently has a fractured pelvis.

It is necessary to take many views to get a particular study. An x-ray examination is a study of a particular pathology. We can be economical by taking several on one plate. We should take several views to get range of motion. Such evidence can be of importance to the arbitrator. We can superimpose one film on another to prove range of motion.

DR. HOLMBLAD then demonstrated various x-ray techniques.

### Peripheral Nerve Injuries

GUY S. HAYWOOD, M.D., had considerable experience during the war with repair of nerve injuries, and from this experience he projected some sound principles to the plantation doctors on what to watch for in nerve injuries. In the case of any fracture, the possible involvement of a peripheral nerve must be borne in mind. Too many times the whole attention is given to the fracture and the symptoms of a nerve injury do not appear until long after. He then indicated methods of quickly determining nerve injury by asking the patient to go through certain motions with his different fingers and his hand in all directions to make sure the nerve was not destroyed. During the treatment of fractures it is well to remember that a tourniquet applied and left on too long can produce nerve injury. A cast that is too tight might do the same, and when a patient is taught to use crutches, it is well to make sure that the position of walking or standing does not bring direct pressure against nerves in the axilla.

Complete severance of a nerve is indicated by a peculiar smooth, shiny texture of the hand below the injury. This also tends to be poorly nourished. If there is any question of malingering, two dry cells, a simple apparatus, can be used to produce an electrical reaction in the nerve.

The question of injury to the brachial plexus is sometimes very important. This might be evulsed by a sugar bag falling on a man's shoulder or a man falling down an elevator shaft or some such injury that suddenly puts strain against it. The concept of when an injured or severed nerve should be repaired has gone through many changes. It was formerly believed that an injured nerve must be repaired at once. DR. HAYWOOD said sometimes it is actually preferable to wait two months and no damage will have been done.... sometimes even longer. However, he cautioned that when the limb is badly damaged, with open lacerations, it is very easy to mistake a small tendon for a nerve, and more than once a severed nerve and a severed tendon have been united. After any nerve operation it is very important to check carefully to see whether the nerve has been properly repaired.

As to the length of time before maximum healing or maximum return of function can take place, it is usually thought that some increased function can be expected up to three years after injury. All known methods of physiotherapy and both active and passive motion should be continued to restore the function to the maximum possible.

### Function and Rehabilitation

EDWARD C. HOLMBLAD, M.D., has had three papers published during the last 20 years regarding this problem. He showed how during this time there has been an increasing interest in the preservation of function, and every attempt is now made to maintain the function of joints, muscles, nerves and bursae in the region of the fracture. It is now recognized that even the texture of bone can be markedly influenced by not keeping a limb too long in complete inaction.

The subject can be divided into three main types of fractures:

1. Fractures not requiring reduction or fixation. These are fractures in which there is little or no displacement and where a neighboring bone continues to splint it, and therefore the patient can continue to use it, usually by means of merely a little plaster strapping.

2. Fractures with displacement or angulation which require reduction and the holding in place of the fragments by some form of solid internal fixation.

3. Fractures that can be reduced and held in position by means of casts, splints, or splints with traction, etc. In all of these, however, an attempt should be made during the treatment to prevent unnecessary swelling and to be particularly careful as to the proper application of tourniquets. Proper circulation must be maintained, but on the other hand if there is a bleeding point, the tourniquet must be tight enough to stop the bleeding.

The reason for immobilization is to relieve pain, and to relieve pain we must relieve muscle spasm. We must also reduce or prevent hemorrhage, and, of course, prevent displacement. It is well to carry in mind an axiom that has held true for many years, namely, if the original trauma was not sufficient to displace the fragments, then subsequent treatments are not going to displace them either.

Passive and active motion must be started as soon as possible. Active motion can be started by suspending the leg, thus taking the weight off the fracture, and exercising the leg in that position. Passive motion must be kept up also, and the bursae must be massaged to keep them from becoming involved. Whenever a circular cast is put on, it is always bivalved while it is still wet. This prevents any possibility of pressure developing within the cast.

DR. HOLMBLAD believes the walking cast should be used and weight bearing started as soon as possible. He sometimes gets this started by the tenth day. Of course, muscle, nerve and bone function must be preserved. Whenever immobilization is applied, an attempt should be made to apply it so that the strong muscles are stretched and the weak ones relaxed. He illustrated all these points with case reports.

### Discussion

DR. GOLDWATER: I was particularly interested in the importance of nutrition in the healing of fractures. In medicine we think of nutrition as important in damaged liver, etc., but I had never thought of it in connection with fractured bones. In the question of timing certain procedures, a definite three or six weeks seems like an over-simplification of the problem. There must be some variation from case to case. What are some of the guiding factors?

DR. I. LARSEN: I did not mean to give the impression that three weeks can be set for all of them, but, by and large, that is right for the majority, if everything goes well and proper attention has been paid to nutrition, etc.

DR. GOLDWATER: We were taught that immobilization of the joint above and below the break was essential. Is that still true or have we learned a better procedure?

DR. HOLMBLAD: Our fracture treatment is in a state of flux. Certainly we are not putting casts so as to immobilize the hip at all, and, unless absolutely essential, joints are not immobilized. Active and passive motion are attempted as soon as possible after each procedure. Early movement and getting away from any unnecessary immobility have prevented much time loss and suffering.

DR. BURDEN: Where there is no displacement, is it not necessary to immobilize?

DR. HOLMBLAD: That is right. The principle is that where the original trauma has not produced a displacement, immobilization is not necessary. In peripheral nerve injuries, one usually has a headache trying to determine where the break in the nerve is. Do you think it important to unite all fibers?

DR. HAYWOOD: If you bring the nerve endings together, even if they do not regenerate completely, something seems to get through, and improvement does take place. It is important however to recognize the tear in the first place.

DR. CARTER: A man had his extensor tendons cut by a piece of steel. When this was healed, he had only 50% motion of his middle and little finger. Can this man refuse an operation that would restore the function of the hand?

DR. HOLMBLAD: You are just beginning to get these problems in Hawaii. Corrective surgery on permanent disability cases becomes impossible for many reasons. The patient may lack the desire to get well. If we are willing to operate after a careful appraisal indicates there is a good possibility of return of function, but the man refuses to have the operation, we can only evaluate the disability as of that time and pay him accordingly. Patients who are involved in litigation are hesitant to admit improvement.

DR. FLEMING: One can't always blame the patient for refusing. He will experience some discomfort in getting the fingers fixed, and he fears it. He is a victim of circumstance, as is the employer. The man is foolish not to take advantage of the surgery, but he is not refusing to get his hand fixed because the hand will pay higher compensation, but simply because he doesn't want it fixed for fear of pain or no relief.

DR. COOPER: What about the breaking of screws between the fibula and tibia? Do you have to remove them? What is the problem in chronic sprained ankles?

DR. I. LARSEN: If the screw is broken, and the fractured is healed, there is no reason for removing it. If there are symptoms, take it out. Chronic ankles are due to lack of recognition of proper repair of the ankle mortise.

DR. HATLELID: Regarding weight bearing in fractures of the shafts of both bones of a leg, how soon is it safe to put on a cast and let the patient walk?

DR. I. LARSEN: It depends upon the age group and type of fracture, but the sooner it can be done without displacing the fragments the better. Frequently it can be started by the third week.

DR. BERGIN: The Industrial Relations Board has ruled that even if a patient is not having symptoms from a screw or other metal insert, it constitutes a permanent disability. Should it therefore be removed?

DR. GOLDWATER: That is a medicolegal problem. If the board has so ruled then you will have to remove the foreign bodies to prevent the classification of the injury as a permanent disability.

DR. HOLMBLAD: In Chicago we are trying to educate our boards. It is nonsense that the mere presence of a foreign body constitutes a permanent disability.

# A Case Report on Rheumatoid Arthritis

J. A. BURDEN, M.D.,
Paia, Maui

THIS does not purport to be a treatise on rheumatoid arthritis, nor even an appraisal of the currently accepted methods of treatment.

I present this case report because of the gratifying results obtained from the use of Ertron in the relief of pain and partial amelioration of disability due to chronic rheumatoid arthritis. The patient was a 65 year old Japanese mother of seven children, whose pregnancies were all normal, and who had a negative history for operations and no serious illnesses prior to the onset of her arthritis. She was always active and during her earlier life performed her share of heavy field work.

Her first attack of arthritis came in 1933, when the upper extremities were involved—shoulders, elbows and wrists. Her pain was extreme and she was bedridden for two months. Every treatment, from heat diathermy to massage, was tried, and all drugs including medications from Japan and China and Hawaiian herbs were taken without much benefit. In 1934 she began to improve and in due time was able to get around and do light work. She remained in this condition until 1944 with only mild exacerbations. In 1944 another severe attack involved not only the upper extremities but also the lower, especially the knees. She soon became bedridden and in time developed flexion contractures of both legs but more marked on the right, and of both hands and elbows. Pain was marked, especially on motion so that she had to be fed, bathed and given personal care in bed with the assistance of her daughter. Although the pain was controlled at first by salicylates and aspirin, she later needed narcotics in increasing dosages. When I first saw her she was taking half a grain of codeine and 10 grains of aspirin every three or four hours during the day and twice that amount at night together with barbiturates in order to get any rest. At times when having acute exacerbations morphine was required to relieve the pain.

I first saw this patient early in 1948 at which time examination revealed a moderately emaciated female with marked deformities of the hands and legs due to contractures. Even slight movement was with effort and extremely painful. She had not been out of bed in over two years except when lifted out for the purpose of changing the bedding. Physical examination was not remarkable except for a blood pressure of 190/110 and a moderate anemia. Her appetite was only fair, and she was troubled with marked constipation.

Various medications were tried with no benefit other than giving the patient signs of gastric irritation and spoiling her already poor appetite. Because of the glowing reports on Ertron, and after explaining that no immediate results would be noticed and that she would probably have to take it for three to six months before any benefits would be perceived, I decided to try it. The patient was a willing guinea pig and proved most cooperative. In September, 1948, I started her on 5 mgm. of Ertron. This was gradually increased to 30 mgm., but at this point gastric symptoms developed so the dosage was reduced and again gradually increased to 25 mgm. which she seemed to tolerate well. No changes were noted for the first two or three months, and she had to be carried on narcotics as previously. Then gradually she noticed that she was requiring less and less medication for relief of pain. She would sleep through the night without being awakened by pain. Her appetite and general well-being improved, and she picked up weight, and could move without discomfort. After four months she could get out of bed by herself, and at six months she astonished the villagers by appearing at the local store on crutches to make some purchases—her first public appearance in nearly five years. After nine months of medication she was able to get around freely on crutches and take care of her personal needs and do some cooking. At that time we ran out of medication and decided to let her go without. She got along fine for about two months, when the pain again started, and she asked to be put back on the medication. Within a week the pain disappeared, and there has been no recurrence since. At present she is getting only 15 mgm. daily and will be taken off medication again after six months. It is still much too early to tell what the final outcome of this case will be, but at the present time the patient is feeling better than she has for the past 10 years. Life has again become a pleasure to her rather than a succession of days and nights of pain and discomfort.

Ertron®, steroid complex, is activated vaporized ergosterol (Whittier Process). Each capsule contains 5 milligrams of activation-products having antirachitic activity of 50,000 U.S.P. units. It is basically a form of vitamin D, apparently without toxic elements.

## Discussion

DR. IVAR LARSEN: DR. BURDEN'S case is very interesting and is the type of result occasionally seen on treatment with many types of preparations, including vitamins, gold, etc. The future of the rheumatoid arthritis picture seems encouraging.

At the present time research is being carried out on probably a dozen or more drugs which are in the main related to ACTH, Cortisone and certain androgenic and estrogenic-like substan-

ces. The early results have been dramatic, and whereas in the past we occasionally saw a case respond as did DR. BURDEN'S, indications are that with the newer drugs, Cortisone and ACTH, all cases are responding rather than an isolated one. The general impression prevails that the need for these drugs is not related to size or degree of illness, but seems a personal idiosyncracy, the way insulin is required. The analogy appears to hold in so far as continuing need is concerned.

Compound E (Cortisone) appears to be specifically useful in rheumatoid arthritis and rheumatoid spondylitis. Little is agreed as to its use in other conditions. ACTH has been used successfully in some cases of rheumatic fever, acute bronchial asthma, gout and other allergic states.

It has also been said favorably to affect tuberculosis and some psychotic states, etc., but these are all small series observations and care should be taken properly to appraise them.

The newer drugs are beginning to show certain things about the rheumatic state not clearly understoood before, and our entire conception of the etiology and pathogenesis of rheumatoid arthritis is changing. We now see that people are able to use joints well which still show objective signs of organic change; they are swollen, somewhat tender and may show synovitis. It seems that rheumatoid arthritis should be properly called rheumatoid-pan or para-arthritis because certain alterations in the periarticular tissues seem to be as important as part of the disease as the arthritis per se.

While these drugs are the most sensational development in recent medicine, nothing is known as to how they work, and little is known or even understood about the possible danger of long-term administration. It must be remembered that the steroids are akin to the sex hormone and to certain carcinogenous agents. Many individuals have suggestions of side effects of many types; masculinization, hypertrichosis, psychotic states and even low-grade Cushing's disease have been recorded from their use. While of extreme interest, they are nowhere near even close to being drugs on which practitioners may, for any immediate time, come to rely. They are present in extremely short supply and are available, of course, for clinical study and not for therapy per se.

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## Disability Clauses in Pension Plans

THE pension plans now being established by many companies often contain "disability clauses" paying a minimum of $50 to $75 after 10 to 15 years employment. For this reason some companies are now appraising the financial risks that may be involved in premature pensions because of diseases of later life—arthritis, heart, kidney or lung diseases, cancer, etc. Non-occupational diseases now become "occupational" in the eyes of some plant managers from the financial standpoint. This fact is causing some companies to reappraise their pre-employment physical examination procedures.

—*Industrial Hygiene Digest*, June, 1950.

# Annual Report of the Medical Adviser, H.S.P.A.
## —October, 1948, to October, 1949—

NILS P. LARSEN, M.D.

IN NOVEMBER, 1949, the Plantation Physicians Association held its annual meeting on Maui. It was a very stimulating get-together, developed as a Seminar on Industrial Medicine. It was headed by DR. LEONARD GOLDWATER, of New York City, and DR. E. C. HOLMBLAD, of Chicago. They brought us up to date on what the trends are in industry relating to medical care. It was also pleasant to hear them praise our own system and results and say that it was one of the outstanding industrial medical systems in America. As far as the local medical men were concerned the tone of the whole meeting was emphasized by DR. HATLELID in commenting on the adoption of the standard card. He said, "Rather than trying to think up reasons why it can not work, if we concern ourselves with how we can make it work, we will have it in successful operation in a short time." This standard card, by the way, is now available to all plantations and will make it much easier when a new doctor comes or when a doctor changes from one plantation to another. It will also standardize our medical examinations.

The growing maturity of T.A.P.P. is shown by the increasing desire of the doctors to become more and more an integral part of industry. In the report to the doctors, I began with the following quote by Richard Weiss from the *New York Times* and an added comment: "Clearly, then, business is not only 'business.' It involves something much broader, much more complex, more human . . . than is implied in the ordinary use of the word. It means, in brief, good and intelligent citizenship. In that sense business men are not different from any other group of citizens. But theirs is a special responsibility." Perhaps as medical men of a great industry, we might well ask ourselves if we have also a special responsibility in helping to create that sense of teamwork and pride in work that is essential for success.

MR. RAY ALLEN in an excellent address to the doctors also urged them to accept their role as liaison personnel and to help interpret problems between workers and management.

IN THE world today, only 16.4% of the people live in developed areas. Sixty-six and nine-tenths per cent live in under-developed—so-called substandard—areas. The average per capita annual income in the first is $461; in the second, $41. Mechanical energy as horse power per day per capita is 26.6 versus 1.2; illiteracy is 5% versus 78%; teachers 398 versus 176 per 100,000; and in health the death rate from tuberculosis is 64 versus 333; life expectancy, 63 versus 30, and physicians 106 versus 17 per 100,000.

The TERRITORIAL ASSOCIATION OF PLANTATION PHYSICIANS is responsible for the health in one segment of a highly developed area, in spite of repeated assertions by labor leaders to the contrary. Their constant assertion that our workers live in a substandard area is not borne out by the facts. Our tuberculosis rate last year was only 73 new cases per 100,000—one third the average for the total of the developed areas. The average weekly earnings of our workers were $44.10—more than the annual income of workers in the under-developed areas. Our infant mortality (a common index of community health) was 23.7 (T.H. rate 28.7), and no infant died of diarrhea or beri-beri (a common cause of death in neighboring countries). Maternal mortality was 1.4, slightly above the last two years.

Nine thousand six hundred and twenty of our people, or 13 out of each 100, spent an average of 10 days each in the hospital. In an average U.S. city, 16 out of each 100 usually have to spend some time in a hospital. We compared our surgical figures with those at the Queen's Hospital whose reputation for good work is undisputed. At Queen's last year there were 1,744 major surgical operations, with 28 deaths, or 1.6%. On the plantations, following 717 major surgical operations there were five deaths, 0.7%. However, on the plantations out of 321 appendicitis operations, two died, whereas at Queen's after 400 such operations, none died. Also for each appendicitis operation at Queen's there were 4.3 other major surgical operations, whereas on the plantations there were 2.2—in other words, Queen's did more of the heavy, difficult surgery; hence, strict comparisons are not justified. These figures hardly support, however, the present craze that only a certified surgeon should ever be allowed to operate. The results seem to lend support to the idea that if a general man is very careful, and thoroughly studies and reads up his case before surgery, as plantation men do, and has had enough training and enough respect for his patient not to attempt to go beyond his depth, then results can be amazingly good. That he does get outside advice is indicated by the fact that the fees paid specialists (non-plantation doctors)* amounted to $23,586.

To emphasize this point I quote from a letter of a former plantation doctor, now practicing in California (R. T. EKLUND):

"The people here are so sincere and friendly and seem actually to hunger for the services of a good, old-fashioned country doctor. The hardest part for me to adjust to over here is the fact that there are so many specialists, and even specialties of specialists, not to say anything about chiropracters and osteopaths who also do surgery and even Caeserian sections. My secre-

*In certain instances "outside physicians" may have replaced salaried physicians while the latter were on vacation.

tary was in an auto accident four weeks ago, and she called me to take care of her. She had multiple fractures of the pelvis (10 fractures, not counting the small comminuted portions), deep lacerations of the face, and a fractured clavicle. She also happens to be a diabetic. As I was not recognized in any of the hospitals at the time, I called in an orthopedic man to take the case with me. However, he did not do suture work, so I had to call in a plastic surgeon for the wounds. Because of her diabetic condition, I had to call in a diabetic specialist, and because of possible injury to the bladder and kidneys a urologist was called. For the first week at least, she didn't have to worry about visitors because she had almost a complete staff of doctors attending her. I'm not trying to say that this isn't good. It probably saved her life, but what amazes me now is the tremendous responsibilities we, as plantation physicians, carried, especially on the isolated spots where we would be lucky if we could get the services for a few hours of one specialist.

"How well I can remember the many nights without sleep, that I stayed up watching the progress of some Ob case, trying to decide if surgical or instrument interference would be necessary, praying God to give me guidance in making the right decision. Also the surgical cases of all sorts with their various complications were entirely our responsibility. One old case I can well remember was that of an Hawaiian lady, age 65, who developed an acute gall-bladder. I found it full of stones. She was an acute case with symptoms showing that operation was necessary immediately. Just that alone would have been sufficient. However, she had hypertension, had severe attacks of asthma, was diabetic, had marked obesity and a ventral hernia about the size of a basketball, cataracts and definite myocardial changes. Conservative treatment was out of the question and hence, I removed her gall-bladder, repaired the ventral hernia and removed her appendix. Although I probably lost a few more hairs on top of my head, she made a remarkable recovery and recently made a trip to Honolulu for a cataract operation. I mention this only because it was just a small example of what I know all the plantation doctors are doing and have been doing for years, whereas over here, there are so many men who have never been in general practice but continued from internship to specialization, and to them it would be nothing short of just being plain crazy for a G.P. to even think of tackling such a thing. My hat off to all plantation doctors!"

Plantation results might also indicate that elaborate hospitals are not necessary to attain good surgical results. But, in speaking of hospitals, all indications point to the necessity of many plantations getting out of the hospital business because of present high costs. In a recent report on hospital costs by the Public Health Committee we read, "It would be fair, on the basis of such arguments as presented above, to deny plantation hospitals immediate eligibility for subsidy, but simultaneously express the hope that, through consolidation and changes in policy of control, a number of these hospitals may make themselves acceptable for future subsidization. It seems reasonable to subsidize a modern, consolidated hospital operated under genuine community auspices; the logic behind support of a number of scattered, privately operated, semi-industrial hospitals is less evident."

Already some plantation hospitals have become community hospitals. The cost of maintaining a modern hospital today is beyond the earning capacity of most of the plantations and beyond the ability of the worker to pay. However, when they become community hospitals we must do everything to keep the control of the boards away from political domination or bickering. People get used to luxuries, including hospitals, quickly. Our plantations prove this clearly. Our statistics show that the disease, disability and death rate is lower than that found in any other rural group. Plantation laborers' homes have most of the advanced luxuries of the U.S.A. There is one automobile for each 2.8 employees, one radio for every 2.2, one electric washing machine for every 2.7, one electric range for every 1.7 employees and one motorcycle for every 251. Around the homes are vegetable gardens and fruit trees that supply a quantity of protective foods for anyone willing to cultivate the available land.

The tuberculosis rate which is particularly high in China, the Philippines and Japan, has taken an amazing tailspin on the plantations .... from a rate of 200 new cases per 100,000 in 1937 to 72 today. Hawaii's many Chinese and Japanese millionaires and professional men indicate that many of our people have reached their highest peaks of ambition. And many an independent farm owner in the Philippines acquired the wherewithal to buy his farm on our plantations. Here was a land of opportunity far above anything that our own countries had to offer. Security was not handed out willy-nilly, but for those with ambition the road lay open to any desired peak, limited only by the ability, energy and stick-to-itiveness of the climber.

We can also understand how our laborers can attain so much better standards than other sugar workers, when we compare their wages with those of the Louisiana, Florida and Puerto Rican sugar workers who are on a minimum of 45 cents an hour or with those in Cuba and Jamaica on a 20 cents a hour wage. Our workers' average earnings in July were $1.04 per hour. Such wages are due not to harder work by our laborers but to the fact that many people invested their savings in our sugar industry. This enabled management (always working more than eight hours a day) to buy machines that in-

creased the productivity of each worker and eased and shortened his working day.

The health of any community is related in large measure to the economic welfare of that area. Good health is never attainable in a poverty stricken country. This is indicated by the above-mentioned tuberculosis death rate of 333 in the under-developed regions compared with 64 in the developed areas. In the Territory the rate was 33. No area can become developed without the investment of the life savings of many thrifty people. The much talked of welfare state is truly a slave state. So-called security is exchanged for freedom. The talked of socialization of medicine is really compulsory medicine for which everyone will have to pay whether they want it or not. You will also have to pay for all the loafers and ne'r-do-wells who will clutter up the clinics and doctors' offices and make it hard for the truly sick to get care. This has happened in England. Security supplied by the state without a struggle kills the best in man. Competition and the spirit of work are essential for growth and progress. We must understand this danger clearly and keep talking to others about it. If compulsory medicine comes, our whole cherished health system will be destroyed, and medicine will be practiced by servants of the state. This is the status to which the regimented, non-ambitious mentality is more happily adjusted than the free man. The latter only asks for an opportunity to work and for no security without earning it. Something for nothing is a false philosophy. The strength of a nation or a community rests on the joy of work.

In spite of these many facts, labor leaders have harped on the idea that Hawaiian laborers live and work in one of the substandard areas of the world; that, it isn't necessary to work hard, and that anyway the only one who works is the laborer. One of their journals states, labor produces all wealth; therefore, all wealth should go to labor. This slogan seems particularly naive when one realizes how much is produced by the machines supplied by the money of stockholders and how efficiency is increased and waste decreased by proper management and organization. Even the medical department increases the efficiency of each man by careful examinations and quick and proper treatment after injury. However, we have a low percentage of doctors per 1000 population. We have been able to attain an excellent coverage by making use of good field nurses who screen the sick and save the doctor much time and energy. Some plantations have felt it necessary to curtail field nurses. I believe, this is a real mistake, since the field nurse is the health educator on the plantation and the doctor's contact with the homes.

The medical departments can help make labor realize the importance of good health work by talking about the importance of health and repeating the results revealed by our health statistics. Eventually we might convince our workers of the truth, and that being an integral part of a cooperative working team will benefit them more than any "hating the boss" campaign. They must understand their part, and that for any enterprise fully to succeed, the spirit of hiss and hate must be replaced with the spirit of understanding and cooperation. Somehow we must get all our workers playing on the same team again. All units including our medical department must each play to the best of their ability for top success. With the rising tide of competition, it will become a survival necessity. There are many people still on the plantations who do not realize that neither industry nor the government has bottomless barrels of money and that, in order to stay solvent, we must produce more than we spend. Self-evident as this seems to us, we cannot repeat it too often. Doctors are frequently accused of not being conscious of cost and waste. Here the doctors can help to reduce the most expensive human waste—animosity.

Our health system has been weak in the field of health education. Recently, I suggested to the Health and Sanitation Committee that we try to do more in this field in line with what is being done in the rural areas of many states and in many industries. The health system can only be half efficient unless the people who are being served understand more about the basic principles of good health, early diagnosis of illness and proper food. We could make good use of a health educator who by the use of colored graphs and the organization of mothers' clubs and health councils could keep teaching throughout the year some of the points we want stressed. Such a person could also keep indicating the attainments proved by our statistics.

A suggestion has also been made that a health calendar be developed, carrying captions printed in Filipino, which would stress the results of our present system. All would be proud of the results, if they knew them. If the workers have been antagonistic towards some of the attempts in building the cooperation we are after, we must take some of the responsibility that we as a health department have not done as much as we could to create a greater understanding and more "sympatica" between the various elements on the plantations. We are quite prone to blame unions when many times the unions by the use of half truths and past truths were able to convince the workers that they were being exploited and abused simply because there was a vacuum in the workers' understanding of what was going on.

May I repeat regarding our statistics that the specific diagnoses listed on the monthly report sheets are used not for the complete accounting of all diseases found on the plantations, but as an index to health. The items selected can be clearly diagnosed. The minimum number were picked to indicate: (a) whether mothers and infants were receiving good care; (b) whether food, water, milk and environment were protected and sanitary; (c) whether parasites and

infectious diseases were more rampant here than elsewhere; (d) whether venereal disease and tuberculosis (public health diseases) were under control; (e) whether the middle-age diseases; heart, blood vessels and cancer were more or less prevalent than expected; (f) whether skin diseases and the allergies were very common; (g) whether the emotional environment was bad; (h) whether industrial disease and accidents were being controlled as indicated by a declining rate; (i) whether surgery was properly available and the mortality not too high; and (j) the two research questions: i.e., (1) is rheumatoid arthritis related to rainfall? and (2) do respiratory diseases and pneumonia run parallel? Whether the patients came to the doctors freely and whether the hospitals were under or over-patronized is also indicated. The percentages on all these questions except calls on doctors and hospital days indicate a lowering incidence. The number of times patients came to the doctor has increased. Perhaps at times they came unnecessarily, and yet such a fault is better than not coming. If the workers really knew and understood all the facts, it seems likely a better *esprit de corps* would develop, and the damaged spirit of aloha between the races which was the result of deliberate incriminations and the unhealthy consequence of these recent years of left-wing leadership would heal. Perhaps as doctors, we can help to sew up this gaping wound, and again attain a healthier and happier community.

Our records mean good health protection, although we might repeat a recent newspaper ad, "The record is wonderful, but fine as it is, it can be made still better." Let us now examine the evidence and see if it indicates that we have been making steady progress. Statements and slogans are so easy, but facts so difficult to obtain. As an indication of what has really happened, the figures of 1939 have been compared with those of 1949 in all important items. The table tells the story.

| Condition | 1939 | 1949 | % Decrease |
|---|---|---|---|
| Population | 100,960 | 69,826 | 31 |
| Birth rate/1000 females | 132 | 79 | 40 |
| Inf. mort./1000 L.B. | 43 | 23 | 46 |
| Inf. diarrhea/1000 under 2 years | 1.6 | 0 | 100 |
| Total deaths per 100,000 | 567 | 567 | |
| Pneumonia deaths | 51 | 18 | 64 |
| Surgical deaths | 21 | 6 | 71 |
| Appendectomies | 648 | 460 | 29 |
| Appendicitis deaths | 7 | 3 | 57 |
| Other major surgery | 483 | 420 | 13 |
| Other major surgery deaths | 12 | 4 | 66 |
| Tonsillectomies | 1320 | 753 | 43 |
| No. hospital accidents | 1107 | 491 | 56 |
| Calls on doctor | 496,000 | 575,000 | 16 inc. |
| House calls | 40,150 | 4,835 | 88 |
| Total hospital patient days | 135,000 | 139,547 | 0 |

These are startling figures, and, I believe, they indicate improved care, skill and techniques as well as the proper use of the new wonder drugs. The past 10 years have seen a greater advance in the actual curing of disease than was accomplished in the previous thousand years. Yet, millions of people in the substandard areas of the world have not even heard of these advances, let alone having the advantage of their use. When we see the death rate for appendicitis drop 57%, deaths from other major surgery drop 66%, infant deaths 41%, deaths from infant diarrhea 100%, deaths from pneumonia 64%, and the number of hospitalized accidents 44% and a decrease in tonsillectomies of 43%, there can be little doubt that there is a dramatic difference in the rates of 1949 over those of 1939. It is interesting to note that with this great decrease in all serious things, the number of doctor calls and the number of hospital days were the only two items that increased. Was this due to the fact that, now that they knew money was collected for medical care, they demanded an unnecessary maximum or was it that now they came for all minor ailments and hence many serious conditions were prevented? To determine the truth would require a long and difficult study.

These records tell us that the plantation population gets excellent care. Bridges stated, he believed the care was inefficient and too costly. The only way to combat such distortion of the truth is to keep repeating the facts. Our own people do not know them. Our medical departments could do a good public relations job by constantly publicizing them. We want everyone connected with the sugar industry to know them, and we want them to repeat these facts at every opportunity.

May I again urge management to recognize the increasing value of a properly conducted health department. It reduces absenteeism. It can help develop good will and better community feeling. It can prevent crippling following disease and accidents. It can help prevent accidents to men who have certain ailments found at an annual examination by keeping them away from hazardous jobs. It can shift men to jobs which will increase their work-life. By proper and constant treatment it can keep men from breakdowns. There are many other ways in which the medical department can be of increasing use, if management would, as MR. RAY ALLEN suggested to the doctors, set aside a definite time each month when the doctor reported to the manager and talked over his problems as other department heads do. He also suggested that the doctor could help more than any one member of the team to increase "job satisfaction" which is necessary for emotional health and happiness, and has much to do with working efficiency.

The medical department has become an integral part of every industry. Where industry has been blind to this, then, as in the case of the New York garment workers and the case of John Lewis and his miners, the unions have taken over. This has often led to merely more power over their men and not necessarily a primary interest in health and efficiency. Our medical department should continue as an important part of the sugar industry.

# Pineapple Plantations' Prudential Plan

WILLIAM H. WILKINSON, M.D.,
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IN THE fall of 1946 the pineapple industry in Hawaii discontinued perquisites, including the medical perquisite, and similar action soon followed in the sugar industry. It was necessary, then, to provide the people with medical service approximating that enjoyed under the perquisite system, and an HMSA plantation plan was developed for use on the pineapple plantations. Under this plan the employees and their dependents were allowed unlimited office calls and a limited amount of hospitalization. The physician was paid a so-called "capitation fee" for office calls and calls for medical illnesses in the hospital but was paid on a regular fee-for-service basis for surgery, fractures, dislocations, obstetrics, and other operative procedures. The sugar industry adopted a plan sponsored by the industry itself which allowed more or less unlimited care for the employee and his family, but the plantation physician was retained on salary.

The HMSA plantation plan worked well when first introduced, but it became necessary to place certain restrictions on its medical coverage, principally owing to the activity of several avaricious physicians, and the patient lost such medical coverage as diagnostic x-rays and unlimited laboratory work, and in addition the premiums were increased. The patient gradually became dissatisfied as he had lost some medical coverage and did not have free choice of physician except for fractures, surgery and obstetrics, and there was no coverage for home calls. In addition the onset of pregnancy was required for obstretical care. The HMSA plantation plan lost money and the pineapple companies became dissatisfied as they were called upon to make up the deficiencies in cash.

Accordingly a new plan was evolved designed to eliminate the undesirable features, and also to be economically stable and yet fit the medical situation on pineapple plantations. Plans were submitted by several insurance companies and, after considerable study, management and labor accepted the one offered by Prudential.

THE Prudential plan (1) standardizes the premium rate for all subscribers regardless of income bracket; (2) allows free choice of physician and free choice of hospitals for the employee and his dependents; (3) pays up to $3.00 for each office or hospital call and up to $5.00 for each home call with no limitation on the number of calls that can be made; (4) pays surgical fees according to a fee schedule similar to the HMSA fee schedule; (5) makes no restrictions on the number of operations that the subscriber may have in any given period; (6) pays $7.50 per day for hospitalization up to 31 days in any illness or operation, with no restrictions on the number of hospital admissions for different illnesses in any given period (the per diem figure is variable to suit the local situation and is reflected in the premium); (7) allows 10 times the day rate ($75.00) for incidental hospital expense on each hospital admission to cover x-rays, laboratory work, operating room charges, anesthesia, medications and dressings, or any other charge that the hospital may make; (8) covers the delivery charge in obstetrical cases where pregnancy begins after the subscriber becomes a member, and pays 14 days hospitalization, plus 10 times the daily hospital rate for incidentals.

It does *not* (1) pay for the first call in any series of calls made because of sickness, although it does pay for the first call in accident cases (a new series of calls due to sickness begins when any two calls are separated by more than 20 days); it does not cover calls made at the time a surgical operation is performed or thereafter in connection with the injury or sickness in respect of which the surgical operation was performed; (2) pay for calls made in connection with pregnancy or resulting childbirth, abortion, or miscarriage, although it does pay for delivery or D & C and allows 14 days of hospitalization as previously mentioned; (3) pay for calls made for medical examinations for "check-up" purposes when not incident and necessary to treatment of injury or sickness; (4) pay for calls made for eye examinations or the fitting of glasses, x-ray examinations, microscopic and other laboratory tests and analyses, or charges for drugs, medicines, and medical supplies unless the patient is hospitalized.

What it costs in comparison to the HMSA plantation plan is as follows:

| | Total Prudential Monthly Premium | Monthly Company Contribution |
|---|---|---|
| Employee only | 2.62 | 1.35 |
| Employee and one | 8.88 | 1.35 |
| Employee and more than one (maximum) | 12.39 | 1.35 |

| Employee Contribution | HMSA Plantation Plan Monthly Premium |
|---|---|
| 1.27 | 2.00 to 4.00 |
| 7.53 | 4.60 to 9.20 |
| 11.04 | 9.50 to 18.50 |

How it works:

1. The Prudential's Outlook: At the end of the first six months of operation 77.3% of the premiums collected had been paid out in benefits with most units showing satisfactory statistics.

2. The Company's Outlook: The company has the satisfaction of presenting to the employees a plan giving excellent coverage at a reasonable cost.

3. The Patient's Outlook: The patient re-

action is based on the Lanai unit and may or may not be the same on other units in this pineapple medical plan. We have found little or no unhappiness over the small charges made for the first calls on illness for which the employee is responsible. We have observed the happiness the patient shows in the security in benefits allowable when attending other physicians than the regular plantation physician.

4. The Physician's Outlook: It has increased the paper work many times over what was previously needed, as it is necessary to submit individual claim forms for each patient's illness. In a group the size of the Lanai unit of nearly 3,000 subscribers and dependents, it is impossible for the physician to do the paper work and a full-time bookkeeper has been employed to carry on this work. The end result is that the doctor has less paper work to do than he previously had under the HMSA plan.

It has the advantage of allowing the physician to see the patient as frequently as necessary or indicated without additional cost to the patient himself, provided the charges do not exceed the maximum allowable under the fee schedule. It provides adequate funds to do the necessary laboratory work, x-ray work and other diagnostic procedures on hospitalized patients without increasing the patient's costs. It provides the long sought fee for service which the plantation physicians have desired.

With a large number of patients subscribing to this plan it allows the plantation physician to follow the advisory Prudential fee schedule, being underpaid for certain procedures and overpaid for others without sending additional charges to his patients. It has materially increased the plantation physician's income.

CONCLUSION: A pre-paid medical plan with broad medical and hospital coverage and with few restrictions has been developed for plantation medicine which presently appears satisfactory to the employer, the employee, and the physician. I am of the opinion that it is the plantation physician's solemn duty to his employer, his patients, and to the art of free medicine that is practiced in America today to make this or any other voluntary pre-paid medical plan work satisfactorily by frequently examining his statistics and by practicing honest medicine. It is the most valuable weapon we have in combating compulsory medicine.

## Discussion

J. F. REPPUN, M.D.: The Patient's Outlook: I agree with DR. WILKINSON in his implication that the employee policyholder is much happier and more satisfied that he was with the previous HMSA Plan. However, in a situation in which the first call-in-illness charge is honestly made as a consideration to Prudential, the employee with a dozen dependents who are always having bad colds or itches, pays many first call charges on top of his monthly premium of $11.04, and he is unhappy, particularly during the lean months of 15 to 30 work days. But he cannot bring himself to give up insurance against a financially catastrophic medical emergency. I have also found in a few instances of excessive frugality, that this one small barrier of a first visit charge, as against the old-time free plantation medicine, has resulted in increasing severity of illness and lost time and wages because the earliest symptoms did not outweigh the consideration of the pocketbook. The assumption of full responsibility by the employee-policyholder in financing his program of medical care in illness and accident, may be cited as a step forward, but only in theory; in actual practice it is almost a nonentity.

The Physician's Outlook: The paper work is overwhelming. I believe Prudential should be urged to figure out some relief from this burden of pulpism. DR. WILKINSON has delineated clearly not only the good points of the plan but also the important philosophical arguments that give the equation: Honest medicine plus a good voluntary pre-payment plan equals the best argument against government medicine. There are many good voluntary pre-payment medical insurance plans in the U.S.A., but if you do not have honest medicine practiced by members of our profession with an interest in seeing the plans succeed financially and otherwise, the equation will not be completed.

The Prudential plan could be ruined by: (1) too much and too long and unnecessary hospitalization; (2) elimination of the private charge on first visits; (3) unrestricted automatic charge of $3.00 per office or hospital visit per day; (4) having the patient return more often than necessary, and (5) cheating—entering false first visit dates or twisting diagnoses to fit the higher fee schedule, such as calling a fistula-in-ano an ischiorectal abscess, a boil an abscess, etc.

In conclusion, may I say that as far as the pineapple people are concerned, the old days of free plantation medicine are gone. Along with the paternalistic, benevolent, though perhaps slow to improve, perquisite system went the excellent preventive health "socialistic" program of the plantation hospitals and physicians. We have stepped out, instead, into the maturity of personal responsibility and individualism that is the foundation of our American democracy. The price of this gain in liberty and freedom is the loss of a preventive medical practice, but if we all now concentrate on education and citizenship to measure up to the new maturity, this loss will be more than made up, and we might achieve in the foreseeable future individual responsibility and freedom plus intelligent self-prevention of ill-health. Would not this be far superior to bureaucratic regimentation?

# A Plantation Manager Talks to the Doctors

R. M. ALLEN,
Wailuku Sugar Company, Maui

I HAVE been closely associated with plantation doctors and with the medical department of a plantation for some 30 years, and I think I know a little of the value this department has been in the past. I know that as a result of the services our plantation doctors have given our people we have had an enviable medical record for many years. I know that our death rate, our tuberculosis rate, our infant mortality rate and our general disease rate are lower than those of any other rural district in the world. I know that they are low because our people have always been given the very best in doctors, nurses and hospital facilities. They have received instructions in the proper types of food, and they have been given excellent pre-natal care.

What I particularly want to get across to you now is that another duty has been added to your job which makes your position on the plantation increasingly important. This comes as a result of the fact that, as one writer expresses it, the American enterprise system, of which the Hawaiian sugar industry is a part, has had added to its phases of operation a fourth dimension in business management.

In the past, production, sales and finances have been our major concern, and most companies have had top executives in charge of each of these. In recent years, however, owing largely to the inroads of outside influences, there has been added a fourth dimension, or the human side of management responsibilities. This is something vital, and has as an object creating security, opportunity and recognition of workers, which added together make for job satisfaction.

The plantation doctor, and the department he heads, can play an extremely important part in this phase of management. A plantation manager leans heavily on his department heads, and because the doctor has the opportunity to see and know every person on the plantation, he can be of tremendous help in bettering the human side of management's duties.

A plantation manager usually sees the assistant manager, the mill superintendent, the field superintendent, or the office manager every day, but I wonder how many plantation managers see the doctor anywhere near as often. We check rather regularly on our production, our purchasing and sales problems and our finances, but do we give the same thought to the one thing that affects all three of these phases? I don't think we do. I don't think a plantation manager has the same close relationship with the doctor that he has with other department heads, and I don't think that there is a mutual feeling of understanding and responsibility. I am not blaming our doctors for this entirely, because I believe the managers are also at fault. But I do think that the situation can very easily be corrected.

Doctors are a highly specialized group. They know much more about their business than any manager can possibly know, but I wonder how many of you consider yourselves as a department head on your particular plantation. You all see the Industrial Relations Department and the Personnel Department on plantations being enlarged and given priority ratings in the organization, but I wonder how many of you think that you are a particularly important part of these departments and have it in your power to be of great help to them. Industrial Relations can step in and work out an employee's personal problem after it has become serious enough for them to hear about it, but in my opinion if the doctor is thinking beyond his professional duties he can frequently discover angles in the field of human relations before they become too serious.

This fourth dimension of business, or the human side of our employees' lives, includes many things the doctor is in a perfect position to detect and analyze. In order to know the employee's attitude on specific problems, possibly not important to us but important to him, close individual contacts are necessary. The doctor's association, not only with the employee but also with his family and kids, can be used to find out what the man is thinking about, what is bothering him and how he can be made more contented.

Probably the most important search in America today is for something called job satisfaction, or for a way to make workers contented, and I believe the plantation doctor and his staff are in a position to be of great help in this important industrial relations problem. Every modern writer stresses the importance of an employee's feeling of security, of importance, of belonging to an organization, and of his reaction to being treated as an individual. If our doctors will make it a point to know every employee by name, know their families, know their family problems, know what is troubling them, and will pass this information on to management, I am sure the human side of our relationships will improve.

For the benefit of our visitors from the mainland, I might point out that this is more important on a Hawaiian sugar plantation than almost any place else in the world because our employees live with us. A mainland business concern is in reasonably close contact with its employees during the working hours of the day, but sees little of them for the remaining hours. Our employees live in our villages, play in our villages, have their family rows in our villages, and we have almost a 24-hour responsibility to them.

Some 35 years ago, when I first came to Hawaii, exerting influences such as I am suggesting were not so necessary because an employee had

no one else to whom to go. The plantation was his life and no one was particularly interested in his welfare except the personnel of the plantation staff and his friends. Now the situation is vastly different because one of the main duties of union officials is personal interest and personal contact with their membership. You know as well as I do the various services the unions offer to their members, and the advice that is freely handed out to them; all of which adds up to a very different picture from what it was 35, or even 10, years ago.

We are in a position to offset this because we are, and should make our people believe that we are, more interested in them than any outsider could possibly be. Our doctors and our nurses can do a lot along this line if they will realize and accept the fact that their responsibility does not end with curing a man's cold.

The doctor can make the employee feel that he is his best friend; he can make him feel that he would rather come to him than anyone else. You doctors represent management in a very large way, and you are just as important as, if not more important than, any other department head. If you will toss morale building influences around in addition to pills and bandages, you can make yourselves even more valuable.

A RECENT survey showed that one of the greatest obstacles in improving worker attitude on the plantation was the lack of believability. Two questions were asked, the replies to which are particularly significant and appropriate to mention at a time like this. One was, "If the plantation bosses were to tell you one thing and the union were to tell you something different, which would you believe most, the plantation bosses or the union?" Seventy-eight per cent replied that they would either believe the union or they did not know which one to believe. The other question was, "Which do you think really wants to do the most good for the workers and their families, the union or the plantation bosses?" Eighty-four per cent replied that they believed the union did, or they didn't know. I think the replies to these questions show what an ineffective job we have done in selling ourselves to our people, and how necessary it is that we combine our efforts to correct their attitudes.

People, particularly in this day and age, like to be treated as individuals. They want a feeling of importance, they want to be treated fairly and squarely, they want a chance to be heard, and they want to feel that they belong to the outfit for which they are working. You men, and those in your department, can go a long way toward filling these human wants if you will realize the importance of doing so. You have one foot in the door already because this same survey showed that 88% of those interviewed thought that the plantations were trying to be fair with the medical plan, which indicates a friendly attitude toward the medical departments.

I am even going to suggest some things I think would pay off in the human relations duty I am asking you to accept. More frequent house calls, particularly on the man you know is disgruntled, or who is a plantation problem, will make him feel that you are interested in him as an individual. This will go a long way towards changing his opinion, not only toward you but toward the plantation in general.

Making it a point to take time out to talk to a man or his wife about personal problems, a football game, or something more than just his bellyache will allow him to know you better and like you more. You may know that those who have made it their job to study human relations and employee attitudes say that in recent years a new axiom or law of opinions has been developed. It is: "Those who know you and understand you best, like you most." Making the employees like you and trust you is very important.

Learning the employee's name, his wife's name and the kids' names will make the employee feel that he is an individual and that you have a personal interest in him. Getting word to management that an employee is in the hospital, finding out through your daily calls on him what could be brought him that would please him, and occasionaliy suggesting that the manager call on him will be of great help to the manager in the performance of his human relations duties. Carried far enough, these efforts will definitely make the employee more contented, and our production, sales and financial duties will be easier.

This is not a one-sided job because I believe the manager should meet you half way in getting together more often and becoming more familiar with your mutual problems. One prominent member of your profession, and he is here today, told me that he thought each manager should set aside an hour a month when he and his doctor could sit down and chat about the various factors that might help or harm plantation health. I don't think this is anywhere near often enough even to discuss health problems, and if you will add this fourth dimension to the picture, a bull session between the manager and the doctor once a day would not be any too often. I try to do this with our doctor, and, although I do not do a very good job, I know that my frequent contacts with him make my job easier, and I hope they are of some help to him.

I realize the value of having our doctor consider himself as a department head, yet we pull stunts just as we did the other day by scheduling an important department head meeting at an hour when he could not possibly attend. This is an example of what I mean by saying that the lack of understanding and association between managers and doctors is not entirely the doctor's fault.

I believe there is another place where plantation doctors can fit into the over-all plantation scheme of things, and that is by assuming the responsibility of constantly getting over to our people the fact that they are getting the very

best in medical attention. You are doing an excellent job in this, but there is a tendency on the part of our labor to doubt it, and increasingly their believability in the type of service they get, what it costs and the benefit that it is to them and their families is highly important. There is propaganda being constantly thrown at our people to the effect that they are living in a substandard area, under substandard conditions, and an effort on the part of you doctors to point out the over-all effects of the high caliber medical service being given them will tend to offset this.

I realize that a doctor is not a health engineer, but I believe that in spite of this he should be interested enough occasionally to go around the camps, and look for and report factors that he feels might influence the general health of the plantation. I am sure that all managers would like to feel that the doctor is interested in the sanitation problems on the plantation as they unquestionably have an effect on the general health of our people, and I am equally sure our people would react well to knowing that your interest in them does not stop when they leave the hospital or dispensary.

Our doctors should familiarize themselves with the financial condition of their plantation for several reasons: (1) to lessen the load of responsibility that a manager carries by not asking for things that are unnecessary; (2) but more important to assist other branches of management in getting our financial picture across to our people in such a manner that they will believe it; and (3) always to keep in mind the fact that lost-time accidents cost us money. I am not making any accusations, but the line of least resistance is usually the simplest course and I can readily see where a doctor would hesitate to argue with an employee who thinks that the splinter in his finger or the cinder in his eye is reason for him to lay off for 10, 15 or 20 days.

The fact remains that we pay our employees two-thirds of their salary for a period which depends on their length of service with us, and the lost-time outlay can run into a lot of money. Our doctors should consider it their personal responsibility to cut this to a minimum, and take steps to see that management provides some type of work for employees who have been injured and cannot do their regular work. There are numerous jobs on the plantation which can be given to employees who are partially incapacitated that would be far better than paying them two-thirds of their pay with no returns. If the doctors will thoroughly familiarize themselves with and be interested in the financial condition of the plantation, they may think twice before they tell an employee to lay off for two weeks because it may appear to be the easiest course to take. You may not realize it, but the financial picture on many plantations is not a pretty one. Many of you know that the plantation of which I am manager is considerably in debt to the banks. We watch every nickel, make every effort to cut down on our inventory, and are continually looking for ways to decrease our costs. The doctor should feel his responsibility in this connection just as much as any department head, and getting this over to our people is vitally important.

Again referring to this recent company attitude survey, the question was asked, "Can your plantations afford to pay you more wages?" Sixteen per cent replied "No," and 84% either did not know or said "Yes." This is almost unbelievable and shows how necessary it is to make our people believe our story. Someone has told them that we are lousy with money more convincingly than we have told them that many of us are broke, and you, being in the driver's seat, can help us because you see every person on the plantation, and because you can, if you will, talk to them intimately with no one else around.

I haven't said anything about the cost of our medical services because the value of this department cannot be properly measured in dollars and cents. We are in the medical business to stay even though it does cost us money because it is so definitely to our advantage to have complete control over this particular service that we give to our people. Most plantations cannot afford to lose what they are losing now on this service, but a revised medical plan or central hospitalization may take care of some of this. I firmly believe that if you doctors will take on a large enough share of the responsibility for the human side of management's duties we would almost be justified in charging part of the cost of your department to our Industrial Relations.

Our payroll is by far the biggest single item in our cost of producing sugar. A plantation the size of Wailuku Sugar Company spends $2,155,000 producing its crop, and $1,276,000, or nearly 60%, of this goes to labor. Increasing the man-day productivity is vitally necessary to all plantations, and is becoming increasingly important as the cost of labor continues to go up. We can't get this without employee satisfaction, employee interest, and believability. Getting all this, is a large order and it will take the combined efforts of everyone. I would like to repeat that our plantation doctors are in a position to do more along this line than any other department head.

I may have fallen down badly on my assignment because for the past 15 minutes I have said very little about our plantation doctors as medical men. I have done this quite deliberately because, just as we as plantation managers are made to realize more and more every day that money is only one of the things that workers want, so are you as doctors faced with the fact that you have a human responsibility to your plantation that is almost as important as your medical duty. You are all performing your medical duty perfectly. Our medical statistics prove that, but I am hoping that what I have said today may make you realize that this additional duty which I believe you have to your company is just as great as your medical responsibility.

# Industrial Application of Preventive Medicine

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IN PREVENTIVE medicine the control of plagues and communicable disease has been successful. Now in addition to these, we have added an entirely new concept. In terms of preventive medicine, we have a new set of problems. We must redefine preventive medicine. We also have to recognize the fact that many diseases cannot be prevented. If the disease cannot be prevented, however, the onset can be delayed or the progress retarded. In this new concept the industrial physician now considers the prevention and shortening of disability.

Whether in the factory or on the plantation, without preventive medicine industry cannot exist. We could not operate sugar plantations without sewerage disposal or proper water sanitation. It is obvious that industrial medicine depends upon industry, and *vice versa*. First, industry provides the tools, secondly industry provides the finances, and thirdly industry has made a tremendous contribution in raising living standards, through education, etc.

How do we define industrial medicine? Its purpose is to assist industry and reduce the cost of production by protecting the worker from injury and disability. There are many ways in which this can be done. The benefits of industrial medicine are too often applied only to field workers, and the office workers and executives are neglected. Industries tend to lose sight of the importance of the office workers. Some of the most successful industrial medical programs have started with the top executives. This is good medicine and good strategy. The problem of selling it to industry is then pretty well licked.

Industry has made other contributions to medicine, particularly in the field of safety. Twenty or 30 years ago workmen's compensation laws were passed. Every production man knows these have helped to reduce cost, and so the safety movement started.

Attention has been turned more recently to the occupational diseases. An outbreak of occupational disease can impair production. The factor which causes absenteeism, however, is mostly the non-occupational disease. What to do about this has been discussed at great length. In Hawaii steps have been taken that are unique. I know of no other place where occupational illnesses and non-occupational illnesses receive equal attention. This is a strong point in your plantation program.

What goes into a preventive program? If we assume that the important point is to reduce sickness absenteeism, we must include that in the preventive medical program of today. (1) The keystone is the physical examination. This is being done on many if not all of your plantations. There are many different kinds of examinations, and the value depends upon the type. (2) It is a little unusual to consider treatment as part of preventive medicine, but it is. In cases of workmen's compensation the treatment shall be provided by the employer. If your objective is to reduce lost time, you must also consider treatment of non-occupational illnesses. (3) Supervision of the environment is self-evident. (4) Health education, in the case of the plantations, is a little unusual in that part of your education should be to show the employees that they are getting the best type of medical care. That might even be your major job—along with health counselling service.

The immunization program must be continued. Also dental programs should be instituted. Rehabilitation, too, is part of preventive medicine. The question of records is important. If you do not have adequate records, no preventive program can be adequate. You have to know how many people are sick, and who are sick, as well as whether a certain percentage is responsible for most of your sickness.

A new type of legislation being seen more frequently is sickness disability laws. New Jersey, Rhode Island, California, New York and Washington now have laws to require employers to provide sickness benefits for employees unable to work because they are ill. At present some 15 or 17 states have bills of this type under consideration. Here we have another cost of production which can be kept down by an adequate medical program.

These things can not be done unless the physician has adequate tools, and any money invested in this direction is well worthwhile. How long does a man stay off the job when he loses a finger, hurts his eyes, etc? All these items go into the cost of production. The doctor's job is to get people back to work at the earliest possible time. Here on the plantations you have an opportunity for an ideal medical practice. The things which contribute to this are: (1) medical costs are paid on a pre-payment basis; (2) group practice is the most efficient way to practice medicine. The same doctors are giving care for occupational and non-occupational illnesses. Centralization, however, should be given consideration so as to insure more uniform service throughout.

Factors which tend to undermine such a program are: (1) unions which do not recognize the program as a real help to their members; (2) employers who think it is too expensive; and (3) doctors who believe it competes with private practice. You must build a defense against the three factors mentioned. If your system is good, and you want it continued, you have to fight for it.

# The Industrial Patient

EDWARD C. HOLMBLAD, M.D.,
Chicago

THE first requisite for a good industrial physician and surgeon is that he be a gentleman at all times, and a similar requisite for a good industrial nurse is that she conduct herself as a lady at all times. I have known doctors to get excited and fly off the handle, and likewise I have seen nurses get angry and excited—fortunately only on very rare occasions. But there are times when doctors, nurses and personnel are working long hours, and it is no wonder that such conditions are accompanied by the increased irritability known to go hand in hand with fatigue. Add to the tired, irritable doctor and nurse an injured, equally tired and irritable employee and you have the makings of an explosive experience. It is remarkable that these do not occur more often.

The first impression a patient gets of the plant physician, nurse and medical department is sometimes very important. It is in this respect that modern equipment, clean surroundings, pleasant, kind, understanding personnel pay such excellent dividends in obtaining the patient's confidence. Show a genuine interest in the patient's injury problem. To him it is most important, even if you can't see objective evidence of traumatic injury. An error of tact is committed when a doctor or a nurse tries to minimize the extent of an injury. It is unwise to say, for instance, "Oh, that is nothing. You should wait till you really get something." It is also unwise to make comparisons between the patient and someone else more seriously injured. To point out that someone was more seriously injured than he was, doesn't help him to recover from his injury. If there is a simple injury, it is much better to make the necessary examination, explain tactfully and without ridicule in a sincere way that it does not appear to be a serious injury, and that you have every reason to believe he will make a complete recovery in a reasonable time. Then proceed to render the necessary treatment carefully and not in a hasty or slipshod manner. There are always instances of the hyper-critical, antagonistic, fault-finding employee who will try the patience of everyone in the medical department. One's first reaction is to argue with him, to prove that his criticisms are not founded on fact. This simply makes matters worse and is just the argument he is looking for. You are playing right into his hands, because in this way he makes a mountainous issue out of a trivial incident. It would seem a smarter and shrewder procedure to be overly nice and, if necessary, over-treat such a patient, if you have the capacity to stand this much abuse and punishment from him. In many instances I have won the patient's confidence by simply taking time to sit down and listen to his side of the story.

There is a graceful and tactful way to send an injured person back to work. In minor injuries it works well to say: "You probably want to keep working?" or "Do you think you can keep at work?" or "Would you like to try to continue working?" These give the patient an opportunity to make the decision. He decides he wants to keep working, and you have avoided that unfortunate situation where he feels you have ordered him back to work even though he was injured. Many a patient resents and remembers for a long time the fact that the doctor was unsympathetic and ordered him back to work, when he believed he should have gone home. I know of instances where patients with simple fractures of the toes, or removal of toe nails, have preferred to go back to work. I frequently take the following attitude in helping a patient make a decision: "You don't have to go back—you can go home if you want to, but the nature of this injury is such that it is perfectly safe for you to go back if you think you'd like to keep going." Then on the release, or back-to-work order, we write for the patient's benefit, "Allowed to continue work." How much better that is than to take a dominant attitude, compelling the man to go back because you ordered it, or even on his back-to-work order to say, "Ordered back to work."

THE term "light work" has become a bugbear to foreman and supervisors. They always suspect the employees of stalling, or seeking special privileges and using their injuries to get soft jobs. For this reason when we are ready to send a man back to light work we tell him to go down and talk the situation over with his boss and see if he has some modified work the injured employee can do. Then when the man comes back or his boss telephones us about the kind of work he can do, we release him to resume modified work. The boss is satisfied, the patient is happy, and so am I. The term "modified work" seems to be a much better phrase than "light work."

There is another time in the course of treatment of injured employees that requires tact and artful handling. This is when treatment is to be terminated and the patient wonders what you are going to do with him or what your attitude is going to be toward him if he has a permanent injury with specific loss or disfigurement. In the first place, we don't believe treatment should be terminated exactly at the same time he is sent back to work. We prefer to carry over the treatment period as may be necessary until the patient has proved to himself his ability to renew work. When a man is released to go back to work we frequently say: "Will you drop in in a week or so and let us know how you are getting along?" If dressings are necessary this gives us the op-

portunity to see him after he has gone back to work. In cases of serious injuries or disfigurement, we tell him when he resumes work that we know there is going to be some permanent injury and we also know there is going to be further improvement, so we will call him at a later time, say between six months and a year, and give him an appraisal examination and report his permanent disability. Some patients try to hurry their disability settlements, seeking them while the injured member still demonstrates considerable disability. If one can reasonably expect any further improvement then the condition is not permanent, and the permanent disability conclusion should be deferred.

## Discussion

DR. REPPUN: When a doctor is a department head, management puts pressure on him to lower costs. When a doctor is on the outside, he can resist that type of pressure.

DR. TONEY: I don't agree with that at all. My boss never puts on any pressure. He wants me to keep his workers well.

DR. HOLMBLAD: All you have to do is practice honest medicine. No manager wants to be a slave driver. Our biggest problem on the mainland is with the private, family physicians who extend the disability periods to unreasonable lengths.

DR. WALLIS: The problem we have on our plantation is the control of the period of rehabilitation following a severe injury. When the patient is ready to go back to work the personnel department must decide what he can do. The problem is to find enough light work to keep all the convalescents busy.

DR. BURDEN: Light work is very important, and it is one factor to which management ought to pay more attention. The patients who can go back to work are much better and improve more quickly working than loafing. Management should make jobs for these men. However, these fellows resent the fact that the lighter work pays less.

DR. CARTER: There is no sliding scale by which you can decide when a man should go back to work. You have to respect the ability of the man to tell the truth. If he is a slacker, you are dealing with a difficult problem. But you must not be too hard-boiled in sending men back to their jobs.

DR. COOPER: I have made out a list of one-arm, two-arm jobs, etc. If you discuss it with the personnel men they can usually find jobs for these people.

DR. GOLDWATER: A list for personnel people to follow was put out by the war manpower board. The doctor can check this list with his personnel director. It is helpful in finding the proper work.

DR. QUISENBERRY: How much value do you place on pre-employment examination?

DR. GOLDWATER: We have gotten away from the term "pre-employment" and use instead "placement examinations." If the pre-employment examinations are causing some refusals, there will be a certain resistance to them. In promoting industrial safety and building up general health of the workers, you must eliminate certain individuals. On the other hand many conditions will be found to be correctible and the term "placement examination" gives the man a feeling he is being evaluated for the proper type of job, rather than being examined for a possible refusal. Sickness disability laws are placing a handicap upon physically handicapped persons and are one of the problems that must be solved in fairness to many who could do good work.

DR. HOLMBLAD: There is no better form of rehabilitation than purposeful work. The will to get well is most important.

DR. FLEMING: What is industry doing about accident-prone workers?

DR. GOLDWATER: Sickness-prone is more common. You can institute a follow-up program and carefully list those people, who are found in every industry. Perhaps with special care many of their recurrences can be prevented.

DR. HOLMBLAD: We are concerned with the litigation-prone type, which is an increasing problem.

DR. LARSEN: It seems to boil down to the individual evaluation we, as doctors, are trained to make. We must recognize that everyone is an individual. Recognize his importance and let him know you are interested. There is no better public relations program.

DR. HATLELID: The responsibility of the plantation physician does not end with determining that the patient is ready for work. He also has to study what type of light or modified work the patient can do and, with management, see that it is available.

Plantation street

New sugar storage plant—Hilo

## Heart Disease in Relation to Employment

### —Panel—

DR. NILS P. LARSEN, moderator, introduced the subject, calling attention to the fact that with the longevity curve in the U.S. rising to 68, we are bound to have more and more problems involving myocardial insufficiency. The old notion of putting all heart cases to bed was changed during the war, by a series of carefully conducted experiments, to the acceptance of the point of view that bed rest weakens both myocardium and circulation. Exercise within the limits of any abnormal symptoms increases the reserve. With the growing number of "heart attacks" this subject has become important in all industries.

DR. LEONARD J. GOLDWATER opened the discussion: (II) *What are the basic problems in the employment of persons with heart disease?*

Throughout industry they are more and more concerned with evaluating the capacity of a damaged heart and then fitting the patient's work to his ability to function without injury to himself. We all know that a person can easily become a heart invalid by being frightened and then becoming over-cautious. In the past we undoubtedly have had too much fear of what might happen to a person working with so-called "heart disease." We are learning more and more that nature tends to warn us when we approach the danger mark, and there is little factual evidence to support much of the fear found in many industries about employing so-called heart cases. We should again carefully re-evaluate our evidence and, in line with much that we learned during the last war, change some of the dogmas of the past. Statistics on heart disease say that some five to 10 million people are affected; so unless we find a way of properly employing them, we will have to support them which would be a great drain on industry as well as doing real harm to most of the "heart cases."

DR. D. S. DEPP: (III) *Pre-employment evaluation of the heart. (A) Pulse rate—what is normal?*

There is a great variation from the successful Marathon runner with a pulse rate of 32 to an apparently normal medical student with a rate over 100. The usually accepted normal is probably between 60 and 90.

*B. Rhythm—what is the significance of irregularities?*

They may have no significance and, if not accompanied by other symptoms, usually mean very little. Each, however, should be carefully evaluated.

*C. Blood pressure. (1) Is hypertension dangerous?*

People with marked hypertension have gone for 20 years without symptoms. Others with malignant hypertension have been dead within three months of discovery. Each case must be carefully evaluated in the light of other findings.

*2. What are the upper limits of normal?*

The usual 150/90 might, of course, be modified, but any pressure, if it is to have significance must be taken on different days, and the elimination of nervous tension or the history of recent exercise must be considered.

*3. Is age a factor?*

Age is not necessarily a factor, but with increasing age we tend to get more of the factors which lie behind hypertension; i.e., cardiovascular disease.

*4. Is there a difference between males and females?*

There is some increased incidence in males, but the significance is not too marked.

*5. What is the significance of an unstable blood pressure?*

It probably gives us an evaluation of the type of sympathetic nervous system the person might have. Because of this, it is extremely important to take a blood pressure on more than one occasion and under different circumstances. Many a normal person will give a high reading under certain stress.

*6. Is a large or small pulse pressure important?*

Again it might be. A patient with an aortic insufficiency might have a tremendous pulse pressure. A patient with a failing heart might have a very small one. On the other hand the normal varies tremendously, but the normal pulse pressure is usually considered 30 or more, but over 50 should be carefully evaluated.

*7. What standards should be set for particular occupations such as railroad engineers, bus or truck drivers, crane operators, etc?*

Since certain types of blood pressures are associated with possible stroke, sudden black-outs, or sudden part-blindness, an evaluation should be carefully done as to the potentiality of sudden loss of consciousness on the part of persons operating expensive apparatus or trains or buses where the welfare of others might be at stake. There are no dogmatic rules that are acceptable, but by a careful evaluation a physician should be able to tell whether some particular case of hypertension might end suddenly in tragedy.

DR. A. S. HARTWELL: *(D) Murmurs and their significance. (1) What is the significance of a systolic murmur at the apex?*

By itself it does not necessarily have any significance. Every murmur, however, should be carefully studied and those that have significance should be separated from those that have no significance.

*2. What factors influence life expectancy and work capacity of various combinations of valvular disease?*

This depends entirely on the amount of dam-

age in the valve; the amount of reserve left in the heart muscle, and other factors such as exposure to disease which might produce a recurrence of valvular infection, the history of sensitivity to infections, and many others which can be evaluated only by careful study. However, it has been shown that a person with rheumatic heart has much less potentiality of living beyond 45 than one without such a valve lesion. There are, in brief, six factors in determining life expectancy: heart size; how many valves are involved; the type of physical activity in which the individual is connected; the question of infections; the type of arrythmia; and the presence of other disease.

The program of a patient will depend entirely on when and under what circumstances the heart begins to show a strain.

COL. F. H. MOWREY: *(E) Heart size. (1) How is the size of the heart best determined?*

It is determined by inspection PMI, palpation PMI, percussion either immediate or mediate (Stroud recently has found 80% correlation with x-ray), and by x-ray. In the latter the heart size is correlated with body weight, height, surface area, age and sex.

Orthodiagram which is too cumbersome.

Teleroentgenogram (7 feet, 2 meters). Measurement of transverse diameter ML/Mr—TD which is compared with a table prepared by Ungeleider (Equitable Life) 90% accurate.

Cardio-thoracic ratio—comparison between transverse cardiac diameter and greatest internal diameter of thoracic cage—of little value.

Fluoroscopy (particularly chamber enlargement):

*2. What are the criteria for determining significant enlargement?*

Increase greater than 10% according to Ungeleider tables.

*3. What is the value of routine x-ray examination?*

Using Ungeleider prediction table can detect 90% significant enlargement.

*4. What is the relationship of heart size to work capacity?*

Paul White states that cardiac enlargement is the commonest and most important evidence of heart disease. Enlargement of the heart indicates that the heart is laboring under difficulties due to a relative increase in the ratio of load to functional capacity and is the tendency to overcome the consequent embarrassment by the compensatory mechanisms of dilatation and hypertrophy.

*F. Electrocardiography. (1) What is the value of a routine pre-employment electrocardiogram?*

The EKG has a definite place in clinical practice even though it is of limited value. It is merely a laboratory procedure and is not a substitute for a good history and careful physical examination. The EKG is of value in determining preponderant chamber enlargement of the heart. It is also of value in unravelling arrhythmias and in determining myocardial damage. Harold Sprague, in studying cardiacs among transit employees, divided the employees with EKG abnormalities as follows: (a) Those with auricular fibrillation, auricular flutter, A-V block, inverted T1, T1 & 2, T1, 2, 3, bundle branch block, and inverted precordial T waves. (b) Abnormal A1 with LAD, diphasic T1, low T1, intraventricular block. (c) Premature beats, LAD, RAD. (d) Within normal limits.

He found that 30% of those in classes (a) and (b) were dead within five years.

*2. Should EKGs be done on selected groups? Which groups?*

They should be taken on selected groups; i.e., those above 40 years of age and those holding key positions or positions where the safety of others is dependent upon the employee.

*3. Is the EKG of value in determining work capacity?*

No.

DR. LEONARD J. GOLDWATER: *(G) Functional tests. (1) What tests have been proposed to determine cardiac reserve?*

There are two types. The Schneider is of no value whatsoever in determining cardiac reserve but is of some value in determining emotional status. The Master Two-Step Test is probably of no value from the point of view of industry. I believe the clinical impression of the individual and a case history of how much he can do without symptoms is of far more value than any test.

*H. How is functional capacity best expressed?*

This is important because people concerned with employment and placement have to have some guide in directing people to a proper job. The New York Heart Association criteria are an excellent guide as to how to evaluate a heart patient. The War Manpower Commission of the Bureau of Manpower Utilization has forms which evaluate all different types of physical activities and allow a recording of the type of working conditions best suited for the person examined. These are excellent guides and should be used. A combination of the two sets of above mentioned criteria gives a person in placement work a functional guide.

DR. ROBERT F. COLE: *(IV) Periodic health examinations in industry. (A) From the standpoint of heart disease, are such examinations of value to the employer?*

It goes without saying that any such examinations are of value to the employee. His health and even life or length of life are directly affected. After detection of any type or degree of heart disease, especially if detected early, proper regime, treatment, and, if necessary, job reclassification can potentially add many years to his life. Even if more advanced types of cardiac disease are uncovered, the life span of the victim may be lengthened by medication,

healthy habits, job change or even retirement. It is of value to the employer because an employee with known heart disease should not be employed in a hazardous job where he would be an industrial hazard to himself, to others, or to expensive equipment. Let us also consider office and supervisory personnel—such a person with heart disease may be quite capable of carrying on in his particular position, but management, if forewarned, may have a capable assistant trained to take over.

*B. How often should periodic examinations be made?*

*C. At what age should annual examinations be considered compulsory?*

*D. Should the older age groups be examined more frequently than the younger age groups?*

After passing a pre-employment examination, the following should hold:

Up to 35 years of age—examination every five years.

Up to 45 years of age—examination every two to three years.

After 45 years of age—yearly examination. (An employee of any age group, found to have heart disease, should have examinations yearly or more often, if necessary.

*E. Should all individuals over 40 have an EKG?*

No. The EKG is often misleading in diagnosis and prognosis, and we have all heard of cases of coronary disease becoming apparent or even causing sudden death, soon after having a normal EKG. Of course, diagnosed cases of heart disease should have EKG's in the follow-up.

*F. What is the value of periodic examination in job placement in the older age group, especially those with heart disease?*

This has been answered previously, but I repeat that a man with heart disease should not be in a job where he is a hazard to himself, or to others, or to expensive equipment. Also, supervisory and office personnel should not be in positions which place them under undue mental and physical strain.

COL. F. H. MOWREY: *(V) Return to work following illness due to heart disease. (A) Rheumatic fever and rheumatic heart disease. (1) How soon after an attack of rheumatic fever may a person be safely re-employed?*

Every case must be individualized. Patient enters convalescent stage when asymptomatic, free from fever, no tachycardia and ESR not elevated. Convalescence continues until patient has been reconditioned.

*2. What job limitation should be imposed by rheumatic heart disease in its various degrees?*

The Army will not accept anyone with valvular heart disease, substantiated history of recurrent attacks of RF or attack within preceding two years. Industrial experience according to Sprague has shown that rheumatic heart disease does poorly. However, many patients do well in limited capacities. The VA rates disabilities as follows: (a) Early congestive failure, 80%. (b) Cardiac enlargement with severe dyspnea, at more than light manual labor, 60%. (c) Cardiac enlargement, with moderate dyspnea at more than hard manual labor, 30%. (d) Valvular lesion, 10%.

*3. What value is ESR in determining status of RF?*

It is the best laboratory method—even better when associated with tachycardia.

*B. Precordial pain (coronary insufficiency with infarction), angina pectoris. (1) What is the significance of this symptom in evaluating the patient's cardiac condition?*

Chest pain occurs in 15-20% of adult patients, according to Tinsley Harrison. Not all pain, however, is due to coronary insufficiency. Pain due to coronary insufficiency is of utmost importance because the diagnosis is made largely by evaluation of this symptom. Only 50-75% of patients having coronary insufficiency have any significant abnormalities detected by physical examination, x-ray or EKG.

Angina pectoris may be defined as recurrent attacks of discomfort in the chest, commonly induced by conditions which impose an additional burden on the heart, ordinarily dependent on disturbance of oxidative processes in myocardium, and always attended by the likelihood of sudden death. The pain may be described in various ways.

Types of Pain (Harrison): Constrictive (squeezing, tight, cramping, heavy, pressing)—40.2%; aching—19.5%; burning—5.2%; numbness—1.3%; lancinating—1.3%; throbbing—zero; vague—32.5%.

Location of Pain: Substernal—54.5%; precordial, left of sternum—39%; left arm—29.9%; front of neck—18.2%; both arms—15.6%.

Duration: 1-30 minutes; mild to moderate intensity.

Provoked by general exertion—90.8%; provoked by specific exertion—10.4%.

Fourteen and two-tenths per cent occur in recumbency; however, all had angina of effort.

Important clinical features: relation to effort; substernal or precordial; duration 1-30 minutes; nitroglycerine increases amount of effort required to induce attacks.

Factors against diagnosis of angina: pain limited to peri-apical, axillary, or abdominal region; lancinating or throbbing pain; aggravation by breathing, coughing, swallowing, sitting, or standing.

*2. Differential diagnosis.* The diagnosis is made by proper evaluation of the symptom of pain, EKG, and the exclusion of other causes of chest pain.

*3. Should precordial pain with ordinary effort preclude the patient from returning to limited work?*

Not if the work does not provoke pain, and the safety of the patient and others dependent upon him is not compromised.

*4. Is precordial pain a better index to the condition of a coronary patient than the EKG?*

Yes. Paul White states that 25% of angina patients do not show any abnormality. Approximately 50% do have EKG changes.

There are three methods of testing for coronary insufficiency by EKG: (1) Reduce oxygen saturation of blood (Levy's anoxemia test). (2) Exercise patient, thus increasing cardiac demand for oxygen (Master's exercise tolerance test). (3) Increase cardiac work with adrenalin. These tests cause various S-T-T changes in the EKG. At a symposium in Chicago White, Katz, Wilson, Kerr, *et al.*, condemned adrenalin and anoxemia tests as too dangerous unless done in special heart stations with a trained anesthetist present. Various criteria have been used.

*5. When is a patient disabled owing to coronary artery disease?*

This answer must be individualized. We first must answer: (1) Is the individual able to carry on with his job with safety to himself? (2) Is he able to carry on his job with safety for others who are dependent on his services? (3) Would the individual be helped by rendering his job less strenuous, or should he be disqualified for service? If there is no cardiac enlargement, the heart tones are of good quality, the individual can perform his duties without producing angina, and his job is not a source of danger to himself or others, he may be allowed to continue his work.

DR. A. S. HARTWELL: *(C) Myocardial infarction (with coronary artery disease, "coronary disease"). (1) How can one determine what is adequate convalescence for a patient who has experienced a myocardial infarction?*

This, of course, varies tremendously with every patient and probably the best criterion is when he is able to return to the maximum work required without any symptoms.

*2. How long a sick leave should be granted to an individual experiencing his first myocardial infarction?*

Such a person should be tested to the amount of activity required by his job. If his job will allow it, a good rule is to have him plan a three-months' minimum and possibly a six-months' vacation. Some doctors believe this should be extended to one year.

*3. What are the criteria for approving an individual for work following an attack of coronary thrombosis with myocardial infarction?*

It depends entirely on the factors above mentioned and his ability to do his work without symptoms.

*4. What job restrictions or limitations should be placed on an individual having experienced an attack of coronary thrombosis with myocardial infarction?*

This would depend partly on the person's temperament, and it is safe to say it would be well to avoid for the first year, at least, any undue strains or stresses either emotional or physical.

*5. What factors may aid in determining these restrictions?*

There should be a careful case evaluation as to what he can do without symptoms and a check on his eating habits, his emotional reactions, and his general attitude toward life.

*6. Will employment, with selective placement, tend to hasten the recurrence of myocardial infarction?*

It will depend entirely upon the person. We do not yet know what produces a recurrence of myocardial infarction.

*7. Why is it important to follow up the job placement of such patients?*

If they do have symptoms it is very important to change their job and evaluate whether the job itself keeps them under stress or strain that might bring on another attack.

*D. Effort syndrome (neurocirculatory asthenia). (A) What is it?*

It has been much discussed. Many people believe it is on a psychosomatic basis. Others believe it is a structural type associated with an imbalance of the sympathetic nervous system and a small dropped heart with narrowed blood vessels. Perhaps there are both types—those who are a born type and have symptoms all their lives, and those who under certain circumstances will develop the complex. The symptoms will be the same, but the latter have a greater potentiality of returning to a full normal.

*2. How important?*

Effort syndrome is important because the patient suffers greatly, and does not have the capacity for doing long continued work without fatigue.

*3. Is it a forerunner of organic heart disease?*

No.

*4. What is the importance of the psychosomatic point of view in diagnosis, therapy and prognosis in dealing with cardiac patients?*

It is important because many such patients have been wrongly diagnosed as heart disease and have suffered as mental heart invalids for years. It is extremely important to make them realize their heart and circulation are not damaged but merely do not have the capacity of others for hard and continued work. They truly must learn to understand themselves.

DR. ROBERT F. COLE: *(VI) The role of the family physician. (A) What advice in relation to work should he give his patients?*

Our position here on the plantations is unique, in that we are both family and industrial physicians. Our advice must depend upon the type and severity of the heart disease and a close tie-in must be had with the industrial physician who in turn will be in close contact with his industrial relations department. The patient may be advised to "take it easy," take a leave of absence, or retire, but the industrial physician must be made aware of, and agree with, the findings, so he can carry the case to the proper authorities.

*B. What is his responsibility to the patient and the patient's family?*

The patient needs reassurance. Since each individual has a different psychic make-up, the physician must know his patient well in order to know how much to tell him. In addition it is the private physician's responsibility to present the case to his patient's employer with the approval of the patient. The family physician must present all the facts of the case to a responsible member of the family, even though he has hidden some of them from the patient.

*C. What is his responsibility to the employer?*

A private family physician has no direct responsibility to the employer, but large or small industries and businesses are of a great economic importance to any community. I doubt, however, that the family physician can discuss ethically a case with an employer without the consent of the patient.

DR. LEONARD J. GOLDWATER: *(VII) Socio-economic factors. (A) Are home conditions and transportation methods important in the total picture of the patient with heart disease?*

In the Islands apparently these are not so important because you don't have the crowding that is seen in the big cities on the mainland. Also you don't have people who have to stand or be pushed for an hour or more every morning and night coming from work. Such experiences might increase the load of a potential heart problem.

*B. Is part-time employment for patients with heart disease practical in industry?*

This is so difficult to control that it has not been practical. However, protected work shops may be of great help.

*C. What is the effect of an aging population on: (1) Criteria for employment of the cardiac patient?*

We must recognize the change of criteria for employment and that possibly the older persons with their greater experience and greater responsibility will more than compensate for their possible reduction in cardiac reserve. The criteria for employment must naturally hinge on the service that can be rendered and, by the proper evaluation, many a patient could probably be saved as a useful member of industry, whereas, without proper diagnosis and then control, such a patient might become a liability.

*2. Retirement age?*

With our increasing age level, we have to recognize that we must not have rigid standards of retirement since we might find ourselves with more people to support than industry can afford. Some individuals become a liability upon retirement, whereas, with continued work even beyond the usual age of retirement, they continue to be extremely useful. We must avoid too much rigidity in this problem, and think in terms of usefulness and ability rather than in years.

*D. The importance of effective relationship between industrial physicians and the family physician.*

Again this problem is not so important in Hawaii since there is apparently an amazing amalgamation between the industrial and family physicians. In this set-up it sometimes is very difficult to find where one begins and the other ends. This is probably a beneficial situation. Frequently on the mainland, jealousies and antagonisms develop between these two groups of doctors.

DR. D. S. DEPP: *(VIII) Insurance and workmen's compensation. (A) Can work cause heart disease?*

This is doubtful, although it is known that a certain blow on the chest, the so-called steering wheel accident, can result in contusion of the heart. By and large, we can say that work does not directly cause heart disease.

*B. Can work involving lifting affect the normal heart?*

No. Although occasionally there has been a report of the rupture of an aorta following heavy lifting, this is rare.

*C. Can contusion, crushing injury or blow on chest injure the heart? How?*

See question A above.

*D. Can trauma directly or indirectly produce disturbance of cardiac function, arrythmias, myocardial failure, coronary insufficiency in the normal heart? Diseased heart?*

Arrythmias are probably not produced nor is myocardial failure. Contusion of the heart can be produced by the mechanism suggested above, and, if there is already disease of the coronary arteries, a severe blow could bring on thrombosis. This, however, when it has occurred, has not been accepted by the U.S. Industrial Board as being an industrial accident. There were three such cases at Pearl Harbor during the war in which a circulatory collapse was followed by thrombosis immediately after a long period of lifting. These cases were turned down as not being work-connected injuries.

*E. Can pain from trauma aggravate heart disease?*

Probably not, though in an indirect way it could initiate a secondary spasm of the coronaries with angina.

*F. Can heart disease cause accidents?*

There have been accidents reported of persons at the steering wheel suddenly having an attack of coronary thrombosis or syncope. Also such a person on a tractor or an engine might suddenly lose control, owing to sudden unconsciousness.

*G. Is angina pectoris disabling?*

It can be very disabling; on the other hand, people with severe angina, controlling it with nitroglycerine, can carry on successfully for years.

Their work must not be associated with hard physical or emotional stress.

*H. Can emotional upsets or disturbances related to unsatisfactory conditions at work aggravate heart disease?*

They probably can, since a person with angina under constant emotional stress will have an increasing number of attacks and tend to become more and more disabled because of them. It is in such cases that the doctor must evaluate the patient's job, his environment and his conditions of work in relation to his symptoms.

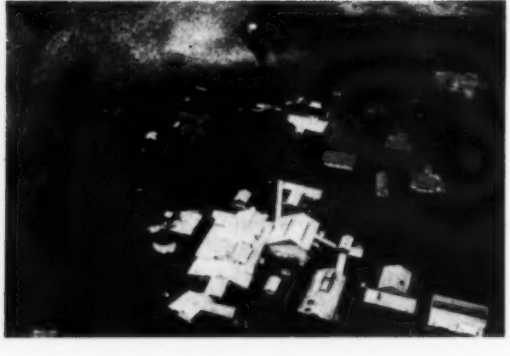
DR. LEONARD J. GOLDWATER: *(I) What are the criteria for total and permanent disability in an individual with heart disease?*

The best criteria are probably those of the New York Heart Association, and it would seem the criterion for total and permanent disability must be when the patient who has had a heart attack can not return to his job without having a return of symptoms. The insurance companies consider anyone who has been disabled three months or longer as a permanent disability, and from then on they evaluate the person at regular intervals. There can be no set time, and a careful case evaluation is necessary.

*J. Second injury clause and fund.*

The Second Injury Clause is that in which a person is accepted with heart disease but with the recognition that if the heart disease becomes the cause of an industrial injury or disability, it shall not be considered as an industrial accident. Such a law would help greatly in getting heart cases returned to industry, since if the company becomes liable, if the patient suddenly dies on the job, it is easy to understand why they would not take such risks. However, if they can accept the individual on the basis of the second injury clause, then they will not become liable in such an event.

DR. N. P. LARSEN: In summarizing the panel, it is very evident that in medicine, particularly in regard to hearts and circulatory problems, we cannot be bound by strict rules because there is a tremendous variability with each case. Each problem and each condition must be carefully evaluated after studying all possible criteria and making repeated examinations. With the number of variables involved we must be careful in coming to hasty or positive conclusions.



Top: Preparing field for sugar cane. Center: Sugar cane coming from field to mill. Right: Airview of sugar mill on Hamakua Coast, Hawaii

# When a Plantation Hospital is Discontinued

P. H. LILJESTRAND, M.D.,
Aiea, Oahu, T. H.

THIS is addressed only to my fellow doctors, but even so, should not be construed as an attempt to "tell" them anything. In fact, it is really addressed only to those doctors who may find themselves in a situation such as mine when the plantation collapsed or to those who are like another doctor, who tells me that it has been pointed out to him that the net loss on the medical service for the year happens to be almost exactly equal to the net loss of the plantation. He feels under implied pressure to prove the justification of the loss on the medical service or else find a way to eliminate it. Along this line our unfortunate experience has already been of practical value to one plantation.

On a few days' notice, the medical service and hospital of the plantation at Aiea were closed. The sudden loss of livelihood affecting three and a half thousand people and the extreme uncertainty concerning the future resulted in a stunned community, paralyzed for a time by emotional tension. There was an immediate outcropping of functional complaints like stomach pains. However, within a few weeks most of the workers had been absorbed by other industries and the community was going again, but under an entirely different routine of living.

As for the hospital itself, one minute after it was closed by the plantation it was reopened as a private enterprise and was soon taken over by an association formed of interested citizens of the community. However, it could operate only as a private hospital, making charges for all patients, and no longer operating a general medical service as before. Gone were the plantation outpatient clinics, the field nurse with her follow-ups, health surveys, health education, and regular physical examinations. A third of the men went to work for the neighboring plantation and thus continued to come under plantation medicine. For the remainder, systematic medical care vanished overnight.

The result of this cannot be demonstrated statistically because all basis for statistics disappeared. That the general health service had disintegrated, however, was continually obvious. Diabetics would show up after a long period of no insulin or urinalysis. Luetics failed to continue treatment because there was no camp nurse to remind them and to check on them when they failed to appear for treatment. The use of tetanus antitoxin rather than tetanus toxoid gradually increased because fewer and fewer of the injured children could show any evidence of having had toxoid immunization, as all had under the plantation. Time and again patients were brought after illness had become serious with the apologetic explanation that since it was now necessary to pay for all visits to the doctor they were avoiding the doctor as much as possible. This is what one would expect and even if statistics were available one would not need to labor the point further. Many expressed the thought that they had never consciously appreciated the plantation medical service until it was irretrievably gone.

THE character of the hospital census changed abruptly. We had been accustomed to having a good proportion of chronic and relatively mildly diseased people hospitalized. It had been part of the plantation policy to be generous with prophylactic hospitalization. Now suddenly people in this class could not afford hospitalization. The chronics went home or to the city hospital at Maluhia or to old peoples' homes. Those with milder diseases and many with severe diseases stayed home. Hospitalization became acceptable only when the situation was serious or desperate, so our census became mostly of that character. As a result a numerical census the same as before now meant much more work for the staff, more nurses, and more pressure on the doctor. Everyone we dealt with was more sick.

Our picture was the reverse of what was to happen in England when free medical care was to become suddenly available. Their calls and hospitalizations shot up. Ours shot down. However, we observed that two groups of patients do not change. There are those who have to be dragged to a doctor even when service is free, and there are those neurotics who go all the time, even if they supposedly pay. This group continued to plague us as before. If they really did pay some bills, it took some of the pain out of seeing them. But many of this class regard unlimited care as some sort of birthright and make no effort to pay, or else they figure out various ways of getting it free, as through the Department of Public Welfare.

Since being on our own, our financial experience leads us to conclude that a hospital that can maintain an average census of 22 can do very well with the help of the territorial subsidy, provided that all charges are realistic, or at least comparable with those of large hospitals, whose charges serve as a handy yardstick.

Rational charges are important if hospital financing is to make any sense. The charges must approach the actual cost. Incompetent accounting is misleading. There was a striking illustration reported from one hospital wherein it was thought that cost per patient day was from $3 to $5 and outside patients were charged accordingly. It was a jar to all when actual cost figures showed the cost to be above $20 per patient day. To get correct figures you must avoid cheating by charging yard men to the plantation main-

tenance department, plumbing repairs to the plumbing department, etc. When we were thrown on our own we were forcibly impressed with these things when we had to start paying regular commercial rates for plumbers, electricians, ambulance repairs, etc.

We conclude that operation of a small hospital is not only feasible but is sometimes desirable. Fallacious is the common belief that because a thing is bigger it is better. It is not necessarily true of the quality of care in hospitals. In fact, the staff of a smaller place, being more intimately acquainted with each other and with the patients, may very well give superior service. We make no claims at all for either physical equipment or service, yet we have a steady trickle of Honolulu people who go out of their way to find a little country hospital in order to avoid what they rightly or wrongly feel is the cold, impersonal, mechanical atmosphere of the large hospitals. Dr. Rothwell quotes one of his nurses from the mainland, who said that in that small hospital, for the first time she felt concerned to make it her business to see to it that everyone lived at least until she got off the shift.

Even financially we have been surprised to find that our cost per hospital day is not above that of the large city hospitals. True, we lack much equipment that they provide. We simply do not attempt to treat patients who require it. Fortunately the vast majority of patients can get along without piped anesthesia gases, x-ray therapy machines, iron lungs, and electro-encephalographs.

Fine walls do not necessarily make a hospital. The personnel is the thing. From a very small hospital in Arabia the famous medical missionary, Dr. Shepherd, reported a large series of operations for strangulated hernia with remarkable results. A visiting critic, sensitive only to visible equipment and unable to appreciate results, complained about the mud floor in surgery. Dr. Shepherd's only answer was "Out here we don't operate with our feet."

This sort of thing may become important as an aftermath of the Meister report. There is now being propagated an elaborate 70-page set of regulations for hospitals that if enforced immediately would put every private hospital in the Territory out of business. (The original edition called for: all lighting indirect; no wooden floors; no medication to be given except on written order of a doctor, not even aspirin). This was temporarily slowed by the Oahu Hospital Council but it is not dead. I do not oppose regulations that are obviously in the public interest, but they should be brief and sensible. Like Europe, however, we are on our way to regulating ourselves to death. (Because of things like this, every hospital that hopes to survive should immediately join the Hospital Association of Hawaii, so as to be informed of insidious developments.)

We conclude that if your hospital is more than 20 minutes from a better available hospital and you have the ambition to keep it going, you can do so if you:

1. Get competent, accurate figures on your costs.
2. Set up your charges on a realistic cost basis.
3. Re-set the insurance charges so that the medical insurance plan can afford these rates.
4. Divorce the hospital from the plantation as Kahuku has done, in order to make it a true community hospital.
5. Be included in the territorial subsidy. This is only just. City corporations do not provide hospitalization for their employees at a loss. They let the community as a whole do it. The sugar plantations, who certainly pay their share of taxes, should do the same.

If you take these steps and have an average census of 22, you can break even or come close to it so far as hospitalization is concerned.

GENERAL medical care aside from hospitalization is of course a separate prblem. This should be, and supposedly is, paid for by the medical insurance plan. The only question here is one of setting the rates high enough realistically to pay the bill. To achieve this, premium rates will undoubtedly have to be increased. For the people to know and pay the actual cost would be a good thing. With perquisites and paternalism supposedly eliminated, it is rather inconsistent to be giving in the medical plan a large hidden perquisite that no one appreciates. Before, medical service was free and the workers knew it. Now a good part is still free and the workers think they pay for it.

We have now cared for some of the same people under circumstances varying from complete free service through various partial insurance plans to the traditional complete fee for service system. As a result I feel strongly that there must be made available to all people strong insurance to provide for all major health expense, but I feel just as strongly that some means of part payment must be retained to keep the abusing group cognizant of the service they are getting. People should get all the medical care they need, but not necessarily all they want. There is a difference. If a man wants extra service, let him earn enough to pay for it, rather than making his more conscientious neighbor pay for it through either insurance or taxation. Whether he be English or I.L.W.U., the simple economic fact must sink in that he cannot demand services and benefits equivalent to another man's full-time labor indefinitely unless he himself produces enough to feed that other man as well as himself.

Medical insurance, like work, should be made readily available. Education as to its desirability should be unbounded. Then those who do not avail themselves should suffer the consequences. Only when their carelessness may harm others should compliance be compelled, for compulsion is degrading and harmful to the human race in-

asmuch as it encourages the present trend toward protection and coddling of the unfittest. The instincts of the New Dealers for compulsion must be curbed if one is to postulate any dignity in individual human personality.

A third component of medical cost, having no relation to hospital losses or insurance plans, is the necessary industrial medicine, the meaning of which has been amplified at this meeting. This is an operating expense of industry which must be properly provided for without confusion with the other two. There is no way to make it disappear.

IN CONCLUSION, this easy lesson on how to run a small hospital without much loss may be misleading. It takes a lot of work and worry and involves a lot of medical and legal responsibility. The government subsidy is bound to be scrutinized more and more carefully, and government controls are beginning to go with it. So, all in all, if there is a hospital within a reasonable distance which will handle your hospitalization for you, perhaps you had better let it.

You will no doubt save a lot of worry and maybe some money, but you probably won't get any better service.

## Nuclear Physics and Effects of Radiation on the Human Body

DR. LEONARD J. GOLDWATER reviewed many new terms that have come into use since the advent of the atomic age. He believes it is necessary that every doctor become thoroughly familiar with the different terms and what they mean. He emphasized particularly that the physical nature of a substance has to do with the nucleus of the molecule, whereas the chemical properties have to do with the electrons. Electrons, protons, tritons, etc., etc., and an understanding of how the nucleus can take on more weight, producing such things as heavy water and how the molecules can become unbalanced, are part of the new chemistry that we must understand if we are to have any comprehension of the new massive literature that has to do with this great force that will either liberate us or destroy us.

The meeting was extremely stimulating and developed into a round-table during which DR. GOLDWATER answered all manner of questions having to do with atomic physics.

DR. ROBERT B. FAUS then outlined the present plan developed for the care of people in case of an atomic attack. DR. FAUS is adviser to General McKinney on these matters. He commented that the Hiroshima bomb dropped on the Aloha Tower would completely flatten all buildings and kill all people from Kalihi to Central Union Church. It would mean probably that most of the medical staffs of the city would be knocked out, and, in order to give medical and nursing care, outside personnel would have to be flown in. During an atomic war there just is no place to hide. In Hiroshima, out of 400,000 population, 170,000 were killed outright and 80,000 more died of the effects. All agreed that every human endeavor should be employed to prevent such a war rather than to experience it.

Plantation Baby Clinic

# Treatment of Eye Injuries on a Plantation

HAROLD KUSHI, M.D.,
Puunene, Maui

DURING the past 25 years, great strides have been made in the field of industrial ophthalmology. However, there are still over 300,000 compensable eye accidents occurring yearly. These do not include trivial, uncomplicated injuries due to superficial corneal or conjunctival foreign bodies. There are in the United States over 8,000 industrially blind, and over 80,000 blind in one eye due to industrial accidents. Approximately 90% of these accidents are preventable.

Because of its delicate structure, the eye is one of the most vulnerable organs in the human body and as such is constantly in danger of being injured. One minute metallic particle flying at high speed or a few drops of corrosive chemical can cause considerable damage which may result in loss of an eye. It is difficult to evaluate the actual damage that results from a loss of an eye, but it has been estimated that compensations from eye injury amount to 5% of the industrial compensation claims. By far, the great majority of eye injuries on a plantation result from foreign bodies lodging in the eye. We shall, therefore, consider this type of injury first.

THE HISTORY is important. The time of occurrence of the injury has a prognostic significance .... complications being practically non-existent from a foreign body removed within the first 12 hours. The place where the injured occurred is also of importance. Injury sustained in the field is of a different type from injury incurred in the mill. The vision of both eyes should be taken as a matter of record. It could be used as a basis for computing any compensation claims which may arise.

POSITION. We like to place the patient flat on his back on an examining table with a pillow supporting his head. This is the ideal position for the patient because he is more relaxed, and for the doctor because he can stand behind the patient and remove the foreign body without imitating a contortionist.

ILLUMINATION. A good source of illumination is essential for the location and removal of a foreign body. A portable spot light or a bright head lamp combined with a binocular loupe is ideal. An ordinary light source plus the use of a condensing lens is also good.

ANESTHESIA. Pontocaine in ½ and 1% solutions is usually the choice because of its effectiveness and because it is the least likely to cause a sensitivity reaction. Cocaine is seldom used because of its tendency to dry the cornea.

MAGNIFICATION. Most of the foreign bodies of the cornea and conjunctiva can be seen with the naked eye. There are a few, however, which are difficult to see unless one uses some form of magnification. Since it is the object to remove a foreign body with the least possible trauma, magnification should be used regardless of the size of the foreign body. The binocular loupe is most commonly used, but for finer work, the slit lamp may be resorted to.

THE EXAMINATION. Some routine should be established in examining eyes with a history of a foreign body, for a certain percentage of them are not due to any foreign body but due to a growth or disease process. Starting with the lids, the following conditions should be looked for: edema, inverted eyelashes, chalazions, hordeolums, and eyelashes in the punctum of the lacrimal passage. Presence of edema of the lids indicates some irritation within the eye.

The cornea is next inspected. Here illumination should be directed from all angles as some foreign bodies can only be detected when viewed from a certain side. The presence of ulcers, clouding, or any break in the epithelium should be noted.

Because of its location in the periphery of the eyeball, the bulbar conjunctiva is very seldom the target of foreign body penetration. However, a thorough search should be made because when a foreign body lodges here, its detection is made difficult because often its color blends with the color of the conjunctiva.

The upper lid is everted and the tarsal conjunctiva is checked as it is here that the majority of conjunctival foreign bodies finally finds its resting place. The tarsal conjunctiva is very thin, transluscent and firmly adherent to the resistant tarsus below. Because of this anatomical factor, only slight pressure need be exerted to cause a foreign body to imbed itself in it. The superior fornix is inspected by taking a squint hook or lid retractor and retracting while the lid is still everted. It is surprising how often a foreign body is lodged in this location.

If after careful inspection, no foreign body is seen, the eye should be stained with fluorescein. Corneal abrasions will show up clearly and this may be the so-called "foreign body" of which the patient complained.

A word should be said about the possibility of the foreign body lying intraocularly. If the history is suggestive, a thorough search for its presence should be made. Marked blurring of vision is suggestive, although not necessary. Corneal laceration, blood in the anterior chamber, perforation of the iris, irregular pupils, opacities of the media, hemorrhages in the retina and retinal detachments should be looked for. And finally x-ray studies should be made to confirm or rule out the possibility of an intraocular foreign body.

REMOVAL. When a foreign body is present in the eye, it is the object to remove it with the

least possible trauma. This is especially true of a foreign body lodged in the center 5 mm. of the cornea, for it is this vital area that is necessary for good vision. Beyond this area opacities that may form are not too damaging. Fortunately corneal epithelium regenerates rapidly, hence injury to it results in rapid recovery with no scarring, provided there is no secondary infection. Any injury to tissues beneath the epithelial layer will not result in regeneration but replacement with connective tissue cells with resulting scar formation.

The instrument used for the removal of a foreign body in the eye is a matter of choice with each physician. The great majority of foreign bodies can be removed simply by using a pointed toothpick with a sterile wisp of moist cotton on its end. In order to remove a foreign body from its bed with the least amount of trauma, the instrument that is to be used must have a tip that is smaller than the body that is to be removed. Some of the finer foreign body spuds that are on the market can also be used, but the larger ones are not suited for this type of work.

A word should be said in regard to the brown, metallic-like stain that is often seen after the removal of a foreign body. This is a product of ionization which results from the contact of metal with cornea. Left to itself it may be covered by epithelium leaving a leucoma, or it may be raised to the surface by underlying regeneration and eventually sloughed off. In any event, healing is prolonged when it is not removed.

The majority of these "stains" can be removed with the original foreign body in one piece. However, there are a few which are difficult to remove because of the depth to which they have penetrated and because there is no definite line of demarcation between normal and "stained" cornea. Rather than incur the possibility of causing needless trauma, this type of "stain" should be left alone and removed 24 to 48 hours later. In our experience the use of dental burrs for the removal of foreign body "stains" is mentioned only to condemn it. It is a crude, unscientific, destructive method of removing such stains.

IMMEDIATE AFTER CARE. With the advent of sulfa drugs and the antibiotics, no need is seen for the cauterization of a non-complicated abrasion or abraded site following the removal of the foreign body from the cornea. For the most uncomplicated injury, uniocular bandaging is satisfactory. For conjunctival foreign body and superficial corneal foreign body, bandaging can be dispensed with. Homatropine and atropine are not routinely used.

I have purposely omitted the treatment of eye injuries that require hospitalization because this is a subject in itself. In closing, let me say that, in the final analysis, the prevention of eye injuries should be the objective in all industrial ophthalmologic work. Toward this objective, we should all strive.

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Plantation store

Conveyor taking sugar from storage plant to ship

# Industrial Eye Programs in Hawaii

W. J. HOLMES, M.D.,
Honolulu

IN THE past decade, human requirements have undergone radical changes. These caused industry to provide a great many new benefits to its employees. Ranking high among these benefits were protective and safety devices of many sorts. Such measures in the long run benefited both management and labor; on the one hand they brought about increased employee morale, comfort and safety, and, on the other, they resulted, or are supposed to have resulted, in increased production, higher profit and reduced accident and insurance rates.

Safety glasses and case-hardened lenses are not new; they have been used for many years by the automotive, steel and other industries and their more general acceptance has long been advocated by the National Safety Council, the National Society for the Prevention of Blindness, and safety engineers the country over.

The lion's share of the credit for the reactivation of interest in industrial ophthalmology belongs to the optical companies. These, with the aid of scientific research men and practicing eye specialists have perfected two devices, which are largely responsible for the recent active participation of industry in various eye programs.

The first of these devices is the hardened lenses which may be specially ground to fit an individual's prescription. These, under severe impact will break but not shatter and hence make more ideal goggles than those made from ordinary glass. The second is a screening device which makes it possible rapidly to screen individuals regarding their visual acuity, muscle balance, depth and color perception, uni or binocular vision at a distance (roughly 20 feet) and at near (14 inches). This information is recorded on a standard chart which at a glance is supposed to reveal the visual status of the subject. If the employee's visual response does not measure up to a predetermined standard, he is referred to an eye specialist for correction and eventually he will be fitted with glasses manufactured from hardened glass. Thus, when he receives his goggles, they will furnish him both correction and protection. If the employee passes the screening test, but is working in an area where splash, foreign body, or glare hazard exists, he will be given protective glasses only.

The sugar and pineapple plantations in the Territory of Hawaii have used protective goggles in some departments for at least the past 12 years. In fact, owing to local demand, on several plantations, a special "Hawaiian type" of goggles was evolved which could be made up to fit both the flat nasal bridge of Orientals and the more bulbous nasal appendage of the Caucasian.

With the advent of the new safety lenses, the eye screening machine and a trend towards increased mechanization of these industries, the use of goggles within the past year became more general. Concurrently, the Hawaii Employers Council introduced a battery of eye and other tests designed to measure various phases of vision and reaction time of auto and truck drivers. As a result, between the sight screeners advocated by the optical companies and the tests administered under the guidance of the Hawaiian Employers Council, to date, roughly 40,000 individuals have been visually screened. There can be no question that a great deal of good has resulted from this intensive eye testing campaign. It stands to reason that out of 40,000 employees who have been screened and 4,000 who have received prescription glasses many are bound to profit. Furthermore, the plan has demonstrated to both employer and employee that a good many eye defects are correctible, that undetected eye diseases may be discovered through screening. and that increased production and efficiency may go hand in hand with alleviation of eyestrain and poor vision.

Management greeted this program with considerable enthusiasm. They believed that these examinations would screen the visually fit from the unfit, and reveal all pertinent facts regarding the seeing apparatus of an employee. They gave employees time off to take the screening tests and encouraged them to have further examinations if such were required; in many instances, they furnished financial aid towards the purchase of glasses. Management felt that by subscribing to this plan they were also saving money. To quote a specific instance, the expenditure involved in the loss of only one eye which includes medical, surgical, hospital and specialists fees, sickness and disability compensation ranges around $10,000. To quote another instance, the purchase price of a 40-ton LaTourneau type of hauling truck is around $40,000. The maintenance and operation costs average about $9.00 an hour; $10.00 to $20.00 then is, indeed, a small price to pay to protect the driver's eyes in one instance, improve his vision in the other, and thus reduce the possibility of injury to the driver and his passengers, and damage to truck and its contents.

However, the eye safety program can if not thought through carefully, also create several misconceptions:

1. That a machine is necessary to screen the visual capabilities of employees. This is not so. The old-fashioned Snellen wall chart at 20 feet and the Jaeger reading chart at 14 inches if standard lighting and distance are used give accurate acuity information, and this is really all that is necessary to screen the visual status of most plantation employees.

2. That those who successfully pass the screening test on the machines necessarily have nothing wrong with their eyes. This belief has given rise to a great deal of misunderstanding. It is difficult for a foreman or a plant manager to conceive of an individual having a disabling eye defect when that individual has just passed the sight screener test with flying colors. Yet, various grades of ptosis, dacryocystitis, trachoma, corneal scars, glaucoma, retinitis pigmentosa and a host of other serious and incapacitating eye conditions may be present which do not interfere with visual performance.

As an analogy, let us take a nurse or orderly who records the weight, height, temperature, pulse, respiration, blood pressure, and chest expansion of a patient, and if all the measurements fall within the normal limits, assures the patient that he is in good health. The inference that such a patient may still have diabetes, syphilis, brain tumor, or fallen arches which incapacitate him for certain jobs is obvious. It is essential, therefore, always to remember we are recording visual skills, not physiological and pathological conditions.

3. That the visual records obtained by means of the screening devices are valuable records and may be used in law suits.

The methods of recording of the tests administered by the Hawaiian Employers Council are so unorthodox that several of us could not convert them into any of the standard systems used in ophthalmology. While the thoughts underlying their examining procedures are worthwhile, their application on the plantation is impractical.

4. That all the tests incorporated in the sight screener are of equal importance and failure to pass any of them indicates some form of ocular abnormality.

5. Decisions of purely medical or optical nature on several plantations under the existing program are often made by industrial relations men rather than the plantation physician or the eye specialist.

6. Last—and this must never be countenanced —attention is paid only to correction of eye defects or refractive errors by spectacles and protection by goggles at the expense of other important considerations.

(a) Among these are illumination and colors: The correction of visual defects becomes a mere locking of the barn door until we comprehend that a visual task is inseparable from its environs and that good vision demands ample light and proper brightness contrast. Proper control of illumination must be supplemented by a careful regard for the use of color in the painting of ceilings, walls, equipment, and machines.

(b) Another somewhat neglected feature is modern first aid care for eye injuries. A well-rounded industrial eye program demands the use of certain new and many old drugs: fluorescein for corneal abrasions and ulcers, Hydrosulphosol for acid, alkali, or thermal burns, duomycin and sulfacetimide for various types of conjunctivitis.

THE sugar and pineapple industries in Hawaii have in many respects kept abreast, if not ahead, of industry on the mainland by providing a program designed to correct errors of refraction and protect against injury.

To maintain these accomplishments at a high level rather than allowing them to become merely a goggle selling project, it must be kept in mind that industrial ophthalmology embraces a variety of problems the partial solution of which may be summed up in the following recommendations:

1. Place the eye program under the direct active, rather than merely nominal, supervision of the medical department. The value of medical supervision of this program has been recognized by the 14th Naval District where its administration has been recently transferred from the safety officer to the industrial physician.

2. Continue to screen the distance and near vision of all employees. This may be done either with the conventional Snellen's and Jaeger charts or on a battery instrument, depending upon the preference of the physician.

3. Repeat screening once a year or once every two years, and remember that most debilitating eye diseases and eye manifestations of general diseases commonly make their appearance after the fourth decade of life.

4. Provide protective goggles for all personnel who may be exposed to splash foreign body, or glare hazard.

5. Be sure that all employees working with machinery or trucks possess a high standard of visual skill. From the ophthalmological standpoint, this group constitute the supermen of the plantation and should have excellent distance and preferably good near vision, normal color and depth conception. If you have no satisfactory instruments to perform these examinations, refer these patients to someone who has.

6. Refer also for correction (refraction) all employees whose vision falls below 20/50 in either eye, those who have symptoms referable to ocular discomfort, and those who are no longer able to read small print.

7. Keep accurate records, having in mind that they may have important medicolegal bearing.

8. Establish a routine for early, efficient treatment of eye injuries and infections.

9. Advise management whenever necessary regarding placement of personnel in jobs which are suitable to the best obtainable vision of each employee.

In closing I would like to quote Lord Byron, who said, "Where machines play a greater role than the physician, the patient is bound to suffer."

(1013 Bishop St.)

# Head Injuries

RALPH B. CLOWARD, M.D.,
Honolulu

THERE is probably no subject in medicine which has produced so much controversy and stimulated so much writing as the subject of head injuries. It would be futile even to attempt to touch upon the anatomy, the pathological physiology of the various types of wounds, the complications and the divergent opinions on the treatment of cranio-cerebral injuries in the brief time that has been alloted to me. I am, therefore, going to limit this presentation to a short discussion of the pathology and the accepted treatment of the two types of head injuries which are encountered most frequently in both civilian practice and war injuries.

The first type of injury is that produced when the head, in motion, strikes an immovable object; for example, falls from high places, automobile accidents, etc. The pathological changes in the brain that result from this form of injury are due to inertia of the intracranial contents. It has been shown experimentally that the brain has the physical properties of a liquid. When the head is set into motion and then suddenly stopped, an accelerated wave of force is transmitted through the brain. The movement of this wave causes a momentary gradation of pressure changes along its pathway from a positive pressure at the point of impact to a negative one at the opposite pole. This negative pressure being lower than the intravascular pressure may result in a rupture of vessels on the side of the brain opposite the blow. This is the physiology of the so-called contrecoup injury. The bony pockets of the skull into which the frontal and temporal poles so closely fit, make these areas of the brain much more susceptible to contusion in this type of injury.

The chief symptom resulting from this inertia of the brain is an instant interruption of consciousness. This is due to a mechanical dearrangement of the molecules within the nerve cells brought about by their acceleration. This may be so severe to some cells as to completely destroy them. The period of loss of consciousness is the best index of the severity and extent of the cerebral damage. It may be momentary, or last for hours or days. The other symptoms, dizziness, nausea and headache are the result of vasomotor changes in the brain. Increased intracranial pressure is not a part of the initial pathology. It may or may not develop later. When it does it is due either to edema of the traumatized brain, or an extravasation of blood into the extracerebral spaces, the brain substance itself, or both.

It goes without saying that in the treatment of this type of head injury no standardized set of rules can be followed. Every case is an individual problem, and its treatment will depend upon the extent and severity of the injury. The length of the time of unconsciousness may be used as a basis for a simple classification of these patients. They may be divided into two groups after excluding a small number who are killed or die within a few minutes of the accident:

Group I includes those patients who are dazed or who are recovering consciousness shortly after the accident.

Group II comprises patients who remain unconscious for approximately an hour or longer from the time of the accident.

In group I, which fortunately represents about 85% of all head injuries, the old adage of "masterful non-interference" is the best treatment. By this we do not mean the patient should be neglected. On the contrary he should be observed closely and frequently for the first 12 hours for any change in temperature, pulse, respirations, blood pressure, and particularly the state of consciousness and ability to move his extremities. Any alteration in these functions may be a warning signal of rapidly increasing intracranial pressure due to hemorrhage. If the accident occurs at night, some one should be given the responsibility of waking the patient every two hours. In the uncomplicated case the only treatment this group requires is absolute bed rest—with the head kept flat, for a minimum of 10 days to two weeks. Aspirin for headaches and a mild cathartic are the only medications necessary. The two weeks in bed for any patient who has been rendered unconscious should be insisted upon. Although it may seem an economic waste to the patient at the time, it is the only sure prophylaxis that can be offered against the development of the disagreeable "post-concussion" symptoms of headache and vertigo which so frequently follow these injuries.

It has been the treatment of group II, i.e., the patients who are unconscious longer than an hour, about which all the controversy and divergence of opinion have arisen as to the correct methods of therapy. Dandy has said, "Present-day treatment of these patients, taken compositely is a curious admixture of tradition, of scientific fact and of fallacies which pass under the cloak of science." This group represents about one-tenth of the cases. In civil practice the injury is produced usually by the occiput striking the ground. The patient is deeply unconscious. If the skull is fractured it is often through the base, with hemorrhage from the ear. The spinal fluid is bloody. A few of these will die within 24 hours from extensive brain damage and intracerebral hemorrhages—a hopeless sub-group. The remainder are hopeful but obviously seriously ill.

It is for the relief of increase intracranial pressure, that the various more radical forms of therapy have been advocated. Dandy says, "Operate on 10% of them"—subtemporal decompression. Munro and his followers advise radical drainage of cerebrospinal fluid by frequent lumbar punctures. Fay leads another group who dehydrate the brain (and the patient) by limiting fluid intake, administering large doses of hypertonic solutions, glucose and magnesium sulfate, and doing lumbar punctures. All of these methods may have their merits in selected cases but not as a routine treatment. It has been definitely shown in many large series of cases that most of these patients actually have no increased intracranial pressure. Only about 5% will show really high pressures—the rest will be normal, or subnormal. It is only reasonable to conclude that these forms of treatment are not only unnecessary but may be harmful by interfering with the physiology of the injured cells which are trying to stabilize themselves.

THE following plan of treatment has been adopted by the majority of neurosurgical clinics in the country. The changes in temperature, pulse, blood pressure, etc., are closely followed as in group I. A fast pulse and low blood pressure are grave prognostic signs. The case is almost hopeless if the temperature rises and respirations become irregular. Steadying pulse and blood pressure, smooth respirations and lessening of unconsciousness are encouraging. A free airway to permit unobstructed breathing is very essential—in other words diligent nursing care.

Fluids are administered in quantities sufficient for normal function of body organs at a basal rate; i.e., about 1500 cc. in the first 24 hours, 5% glucose being given by veniclysis. If the patient is still unconscious after the second day, a nasal tube is inserted and high caloric liquid foods and fluids, 2400 cc. in 24 hours, are given. Vitamins and medication can be given through the tube. If the patient is restless and the cause is not due to a full bladder or a wet bed, it may be controlled by barbiturate drugs or paraldehyde given via the tube. Morphine or other narcotics should never be given to a patient with a head injury. This is one of the most emphatic NEVERS in medicine. In the beginning no lumbar punctures are done and no hypertonic solutions are given.

After three or four days, if the patient is still unconscious, semi-conscious and restless, or conscious and complains of severe headache and examination shows a stiff neck, a slow pulse and a slightly elevated temperature—these are the signs of blood in the cerebrospinal fluid. Lumbar puncture may then be done, and marked relief may be given the patient and his condition improved by removing 10 or 15 cc. of this blood fluid. The procedure may be repeated daily until the fluid is clear.

The lumbar puncture may show a marked elevation of spinal fluid pressure with very little or no blood in the fluid. The neurological examination may reveal progressive weakness of one side and possibly blurring of the optic nerve head or actual papilledema with retinal hemorrhages. This is indicative of either an acute edema of the brain, or a collection of blood in the subdural or extradural space. The patient is then taken to surgery and trephine holes made in the skull over the areas of the suspected hemorrhage, determined by the abnormal neurological signs that have developed, or by the site of a linear fracture seen in the x-ray. If a hematoma is found it is evacuated. If none is found the patient's condition is probably due to edema. Then, and not until then, should the use of hypertonic solutions be resorted to. Fifty per cent glucose in 100-cc. doses given intravenously will shrink down an edematous brain and is of value when the existence of edema has been verified as described above. However, if given before the trephine holes are made, more harm than good may be done. If the brain is shrunk by the glucose the subdural space is widened and an existing subdural hemorrhage may be increased.

In general, this plan of treatment is a very conservative one, but in the light of our present knowledge it is felt unwise to interfere with purposeful changes in physiology and pathology after trauma unless the indications are clear and definite.

THE second type of injury is that produced when the head which is stationary is struck by a moving object. Objects may be large, traveling at relatively low velocity, falling objects such as timber, stones, etc., or may be small missiles traveling at a high rate of speed, as bullets, bomb fragments and shrapnel. These are the wounds most frequently encountered in war.

The pathological changes in the skull and brain in this type of wound are altogether different from the first group. In these wounds the force applied to the head is concentrated in one area. The extent of the injury, of course, will depend upon the size, shape and composition of the missile and particularly its rate of speed. In general one may say that the maximum injury to the head will be found at the point of contact of the missile rather than at a remote point as in the type of injury previously described. When the missile is very large and traveling at low velocity, the entire head may be set into motion so that in addition to the local crushing injury produced by the missile there is added the "contrecoup concussion" with its symptoms of unconsciousness, etc. If, however, the missile is small and traveling at a high velocity, the head may be struck, perforated, and the brain penetrated without the individual even knowing he had been hit. An acceleration of the brain is not produced by such an injury, therefore, there

is no interruption of consciousness. Between these two extremities all variation of injury may be seen. Most of the wounds produced in this fashion are compound, depressed skull fractures. Their treatment is obviously surgical. The general principles in the surgical treatment of these wounds as outlined by Dr. Harvey Cushing in the first World War are well known. A detailed description of the technique need not be given here. However, there are two pieces of equipment which are indispensible for surgical examination of these brain wounds: (1) A strong suction apparatus, and (2) an electric-coagulating machine. We may list the most important of these principles as follows:

1. Remove all foreign material from the wound.

2. Careful debridement of all injured tissue, cutting the ragged edges of scalp and dura and removing with suction the damaged brain.

3. Complete hemostasis, using the high-frequency electric current.

4. Tight closure of wounds, without drains. The large defects in the dura which cannot be closed are patched with periosteum or fascia lata.

5. Prevent infection by thorough cleansing of wound at time of injury; early operation—within six hours if possible; generous use of penicillin and sulfonamide drugs on the initial dressing, in the wound at time of surgery and by mouth 10 days postoperatively.

6. Minimum of two weeks in bed.

7. Anticonvulsant drugs to be taken for at least a year after the injury.

In conclusion we may predict that the mortality of head injuries as a whole will be definitely lowered if the principles of treatment as herein described are universally accepted and adhered to.

(1013 Bishop St.)

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Conveyor carrying sugar from trucks to storage plant

# Treatment of Chest Injuries

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ALL TREATMENT of chest injuries is based on two principles: (1) Treatment of surgical shock and hemorrhage if present, augmented by the free use of oxygen, and the wise employment of transfusions, which must be given carefully because of the upset cardio-respiratory balance; and (2) Restoration of the thoracic viscera and of the intrathoracic physiology and dynamics to the normal status in the shortest possible time with surgical interference only for definite indications.

The great majority of injuries involve the chest wall, pleura or lungs singly or in combination and may be either unilateral or bilateral. Following the immediate treatment for shock and hemorrhage and the necessary surgical dressing of wounds we must attempt to restore the mechanics of the cardio-respiratory system to their normal state and then maintain an approximation to this as close as possible.

In any discussion of chest injuries, the understanding of crushing injuries and their complications will give a much clearer insight into the present-day treatment. The immediate concern in crushing injuries is to keep the patient alive, and if one keeps in mind the causes of death in such cases and the underlying pathology, the rationale of the treatment becomes clear.

Crushing injuries of the chest may cause anoxia and death from the following disturbances of the delicately balanced cardio-respiratory function: (1) Hemorrhage—intercostal, internal mammary, or pulmonary artery. (2) Cardiac tamponade—circulatory failure due to inadequate filling of the heart resulting from pressure or traction on the auricles and superior vena cava. It may be due to pressure from pneumothorax, massive atelectasis, hemopericardium. (3) Respiratory failure—the least frequent cause of death from chest wounds, for even a small area of lung providing it is functioning properly will sustain life. (4) Acute pulmonary edema—caused by pressure on the pulmonary veins, by mediastinal emphysema or hematoma, or by shock.

It is essential in the treatment of crushing injuries of the chest to diagnose accurately the pathologic conditions present and to understand clearly their effect on the physiology of respiration and circulation. A crushing injury of the chest may fracture numerous ribs causing paradoxical respiration from a flattened chest wall.

The following pathological conditions should be kept in mind: (1) airway obstructed with blood; (2) flapping chest wall; (3) hemothorax; (4) tension pneumothorax; (5) massive atelectasis; (6) subcutaneous and mediastinal emphysema.

All of these will be discussed individually. We must remember that any and all of them may occur in the same individual.

FRACTURED RIBS: Uncomplicated fractured ribs have little indication for nerve block therapy other than to relieve pain. Patients are usually ambulatory and have adhesive strapping applied. The associated pain is the most annoying complication during healing of a fracture. Complete pain relief can be obtained by paravertebral nerve blocking. It is recommended that in addition to the nerve corresponding to the fractured bone the next above and below be injected.

Absence of pain permits restoration of normal function in the respiratory tract and thus prevents the complication of the development of atelectasis and pneumonia. Generally two to three treatments are required.

Technique: (1) A skin weal is made with 1% novocain in the mid-axillary line in the intercostal space below the rib involved. (2) Locate the lower border of the rib and inject 2 cc. to 6 cc. of 1% novocain. Care must be taken to avoid entering the pleural cavity and also meticulous aspiration is mandatory to avoid introvascular injection. As a rule, an intercostal nerve block will last from four to six hours.

PARADOXICAL RESPIRATION: In this case the injured side will move inward during the act of inspiration and outward during the act of expiration. This is directly opposite to the normal pattern of breathing. Here the treatment lies in fixing the chest wall in the easiest manner possible. This can best be done by the application of a firm binder to the chest wall, intercostal nerve blocking, having the patient lie on the affected side, and oxygen therapy.

FRACTURE OF THE STERNUM: This gives rise to paradoxical respiration. In this case the previously described treatment will not prove adequate. One method of treatment is the application of uterine tenaculi or towel clips through the skin into the sternum and then attach these to an overhead orthopedic frame by means of traction cords. As a rule not over four to five pounds of traction should be used. Again supportive therapy such as intercostal nerve block, an adequate airway, and oxygen are indicated.

INTRABRONCHIAL HEMORRHAGE OR AIRWAY OBSTRUCTED WITH BLOOD: With the presence of blood and mucus in the bronchial tree, there is no doubt that bronchoscopy is the most effectual method of clearing the airway. Unfortunately there is not always someone available to perform this procedure. The insertion of an intratrachial catheter may prove of benefit in a certain percentage of cases.

Technique: (1) Grasp the patient's tongue with gauze and pull as far forward as possible.

(2) Insert a No. 16 or 18 catheter through the nares. (3) If the patient is conscious, have him take a deep breath and at the same time push the catheter forward. It should go directly into the trachea and the patient will cough immediately. If suction is available this can be applied. (4) If the patient is unconscious insert the catheter in the same manner and test by applying the end of the catheter in a small glass of water. It will bubble freely with each breath.

HEMOTHORAX: Bleeding into the plural cavity in patients who survive long enough to reach a hospital usually occurs either from lung or from the intercostal or internal mammary vessels or the chest wall. The dangers of its presence include acute blood loss, interference with respiratory exchange, and loss of lung functions with possible infection if a massive clotted hemothorax or a fibrothorax develops.

Bleeding from the lung stops spontaneously as the lung collapses, while bleeding from the chest wall may have to be controlled at operation. If the patient is received in shock and the blood pressure once restored by transfusion drops again, the possibility of continued bleeding from an intercostal or internal mammary artery must be considered. Hemothorax is best managed by early and repeated aspirations in an effort to keep the pleural cavity dry and the lung fully expanded at all times. Blood can be withdrawn beginning 24 hours after injury or earlier if it causes respiratory embarrassment. The volume of blood removed is determined by the patient's reaction. A complaint of tightness in the chest is taken as an indication to stop the aspiration. From 500 to 1000 cc. can usually be removed at each thorococentasis. Aspirations are continued daily or every second day until the chest is dry and remains so.

PNEUMOTHORAX: Air may escape in the pleural cavity from a tear in the lung or a hole in the chest wall. The lung may be ruptured from a crushing injury with or without rib fractures or it may be lacerated by the sharp ends of indriven ribs following a direct blow. Ordinarily, unless a tension pneumothorax develops or other chest injuries are severe, the presence of air in the pleural cavity is not a serious complication. If it is causing respiratory embarrassment, the air may be withdrawn. Otherwise it is ordinarily rapidly absorbed.

Sometimes a valve-like action at the pleural tear in the lung allows air to enter the pleural cavity with each inspiration but not to escape during expiration. Air gradually builds up in the pleural cavity under a positive pressure. The lung on the affected side becomes collapsed, the mediastina becomes displaced to the unaffected side and serious interference with respiratory exchange develops. Air must be withdrawn from the pleural cavity promptly if the patient is to escape death from suffocation. This can easily be accomplished by inserting a needle through the second and third interspace anteriorly and withdrawing the air. If no change in the pressure occurs a small catheter may be inserted into the chest and attached to a closed drainage bottle on the floor at the bedside. The lung will usually reexpand within two to three days.

SUBCUTANEOUS EMPHYSEMA: Subcutaneous emphysema following injuries is not infrequent and is often seen after blunt chest injuries as well as after penetrating wounds. In the majority of instances, active therapy directed toward controlling the spread of emphysema is unnecessary as the process is a self-limited one and subsides spontaneously. There are cases, however, where the emphysema is progressive, respiration becomes much embarrassed and the circulation is interfered with. Such cases, unchecked, may result in death.

The method of approach in curing subcutaneous emphysema will depend upon the type of injury and its extent.

1. In true mediastinal emphysema, mediastinal decompression should be employed. This can best be done by a small incision in the suprasternal notch and adequate drainage of the air from the mediastina. Occasionally needle aspiration suprasternally or parasternally may suffice.

2. A needle or catheter may be introduced into the pleural space and underwater drainage established. This will interrupt the further extension of air across the pleural space into the subcutaneous tissue.

3. Thoracotomy with suture of parietal pleural alone may be enough.

4. Combination of these methods in cases of extensive and rapidly forming emphysema may be utilized.

5. Expectant treatment may be enough when careful observation shows there is little or no progression.

PENETRATING WOUNDS: Penetrating wounds add to the conditions already discussed, the possibility of infection, retained foreign body, or open pneumothorax, with possibly a sucking wound and mediastinal flutter. Most of the small penetrating wounds will not require operative treatment. But should the wound be large and sucking or if the ribs are splintered, debridement of chest wall with closure of the pleural cavity is necessary. With regard to foreign bodies, such as small bullets, it has been stated that those less than one centimeter in length can probably be left alone unless they occupy a position close to a major vessel or bronchus.

IN SUMMARY, it should be remembered that the most important consideration in the treatment of chest injuries is to restore the mechanics of the cardiorespiratory system to its normal state and then maintain an approximation to this as close as possible.

# Essentials of Superficial Roentgen Therapy
## —An Outline for the General Practitioner—

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IT IS probably more important to know when not to use superficial x-ray therapy, than to know when to use it; but a little knowledge of either, or both, can be useful to the general practitioner. I have suggested elsewhere that superficial x-ray therapy is potentially dangerous, which it certainly is; but if certain principles are understood and certain limitations and contra-indications are adhered to, the risk of doing harm is small and the potentialities for doing good are considerable. If you're going to use it anyway—and perhaps you should—at least you should use it properly.

EQUIPMENT: Just owning an x-ray machine isn't enough. It must be a machine with a tube capable of standing up under the long exposures used in therapy, and this you can determine by asking the company or its representative. And it must have its output of x-rays accurately and quantitatively calibrated. This is easily done with a Victoreen dosimeter; you measure the output in air (i.e., not at a skin surface) at a convenient distance from the anode (say, 30 cm.), in roentgens (r) per minute.

This must be done for a specific kilovoltage and milliamperage and for each amount of filtration you will want to use.

It is better still to measure it for 1 mm. of aluminum, 2 mm., and so on up to 6.0 mm.; then you can plot these amounts on a curve and determine from it the half-value layer or "hardness"—the penetrating ability—of the beam. In the example given, the half-value layer, which is the thickness of an aluminum filter that will reduce the output by half, is 2.0 mm. of aluminum for the unfiltered beam and 3.5 mm. of aluminum for the beam filtered through 2 mm. of aluminum.

The importance of the half-value layer is that it tells you about how large a dose of this particular x-ray beam will be required to produce erythema on the average skin. This is called the skin unit or erythema dose, and it varies from about 300 r for beams with a half-value layer in the neighborhood of 0.5 mm. of aluminum, to 400 r for half-value layers around 2 mm. and 600 r or more for highly filtered beams with half-value layers measured in fractions of a millimeter of copper. This skin unit is useful because long experience has shown that one-fourth of this amount may be given weekly for about 12 or 15 weeks with a satisfactory therapeutic effect and without significant risk of producing permanent skin damage.

Similarly, a single skin unit dose may be given in one sitting with only temporary damage to the skin; however, this is rarely advisable.

PHYSICAL FACTORS: Now that you have your machine calibrated, you should give a little thought to the physics of x-rays, because some understanding of this is necessary in order properly to regulate dosage.

Quality of x-rays: X-rays affect tissue primarily by being absorbed in it, rather than by passing through it. A given beam of x-rays contains, like a beam of sunlight, a mixture of varying wave-lengths, some very short ("hard" or highly penetrating), some very long ("soft" or slightly penetrating), many in between. The total amount of all wave-lengths is the amount you have measured in r per minute, and the average "hardness" of them all is measured by the half-value layer.

In general, the lower the kilovoltage used, the larger the proportion of x-rays present. With a shock-proof, oil-immersed tube, operated at 90 kvp. (kilovolts, peak) and 5 ma. (milliamperes), about half the x-rays will be too soft to pass through approximately 2 mm. of aluminum. In other words, this will be the "half-value layer" for the unfiltered beam from this machine. If you operate the machine with this amount of filtration, it will have only half the output, in r per minute, but a given dose (delivered in twice the time) will be much more penetrating. It will affect the epidermis less, and the sebaceous glands, sweat glands, blood vessels, and subcutaneous cellular infiltrates and exudates, more.

Increasing the kilovoltage has a similar though not identical effect: it increases the intensity of the beam, especially in the shorter and more penetrating wave-lengths, and also increases the total intensity; in other words, the r per minute is higher, the half-value layer is larger, the penetration into the tissues is deeper, the effect on the epidermis is relatively less, and the effect on the deeper structures is relatively greater.

Back-Scatter: The size of the area being treated has an important effect on the dose. The effective dose of x-rays depends (other things being equal) on two things: the dose delivered to the skin, as previously measured in air, and the additional dose liberated in the tissues themselves as they are struck by the x-rays from the machine. The production of these latter x-rays is called "back-scatter," and it depends pretty largely on the volume of tissue affected by the primary beam. Suppose that 90% of the beam penetrates to a depth of 2 cm. Then if the diameter of the field you are treating is, say, 20 cm., and its area is therefore roughly 300 square cm., the volume of tissue in which back-scatter is being produced is about 600 cc. If the diameter of the field is reduced to 2 cm., however, the area will be only about 3 square cm., and the

volume only about 6 cc., or 1/100 of that with the larger field, and the amount of back-scatter will be negligible. This means that larger doses can and should be given when very small areas are being treated, in order to get approximately the same effect.

The lack of back-scatter need be taken into account, in practice, only with fields under 3 or 4 cm. in diameter.

Overlapping: With larger fields, 20 cm. or more across, and in the treatment of large areas like the entire chest or the upper back, or rounded areas like the arms or legs, another factor must be considered, namely, the decreased intensity away from the center of the field. This drop is greater toward the ends of the tube than toward its sides, and greatest toward the anode end of the tube, but it occurs in all directions because of increased distances (from the anode) of points on flat surfaces. It may be minimized in three ways: by careful centering of the tube over the point needing the largest dose; by increasing the focal-skin distance (if it is doubled, the time must be quadrupled, in accordance with the rule that intensity varies inversely as the square of the distance); and by overlapping of fields. If two exposures are needed to cover a given area, each should overlap about one-third of the diameter of the other. Similarly, in treating a lesion which half encompasses a rounded place such as the arm or leg, two exposures should be given, one skin-target axis at right angles to the other, with full overlapping of the two.

CONTRA-INDICATIONS: Never irradiate any patient who has already had an unknown amount of radiation therapy. You cannot know how nearly such a patient's limit of tolerance may have been approached, and your additional treatment may reach and pass this amount, producing an x-ray burn for which you will be morally and legally responsible.

Never irradiate any lesion unless you are sure of the diagnosis. It might be a malignant neoplasm, and you would be apt to under-treat it; it might be a highly insensitive lesion, and you would do it no good; it might be something which would be made worse by irradiation.

Never irradiate any lesion which can be cured in a reasonable length of time by ordinary treatment: tinea circinata, for example, or most cases of tinea of the feet, or impetigo, or pityriasis rosea.

Never irradiate any lesion which is essentially incurable, such as dandruff, or psoriasis, or recalcitrant pustular eruptions of the hands. If you do so, you expose the patient to the risk that it will be done again and again, if not by you, then by someone else, until his x-ray tolerance is exhausted and no further irradiation can be given, no matter how badly it may, at some future date, be needed. The occasional use of x-rays in such disorders should be left to the specialist.

INDICATIONS: In general, superficial x-ray therapy should be used as an adjuvant to topical or other treatment, to accelerate an unduly slow response which is already occurring; and, in a few conditions, to induce healing which cannot be brought about in any other way. For a complete analysis of the indications, reference should be made to a textbook, such as MacKee and Cipollaro's "X-rays and Radium in the Treatment of Diseases of the Skin," but a few of the major indications may be briefly reviewed here.

Cellulitis, furuncles, carbuncles. Here is one of the clearest indications for x-ray therapy. It is of little value after fluctuation is established, but during the first two or three days a dose of 50 to 150 r, unfiltered or lightly filtered, repeated daily for two or three days, will greatly enhance absorption of the infiltrate or, after the first or second day, localization and softening. Antibiotics should be used too, of course, and fluctuant lesions should still be drained.

Acne vulgaris. Never irradiate lesions of acne until all routine methods of treatment have been exhausted, and the patient is at least 18 years old. X-rays always help acne, but they do not cure it; unless the patient "outgrows" it within a year or so following irradiation, it will recur; and it isn't desirable to repeat the process, for fear of radiation sequelae. A suitable technique for most cases is as follows: 90 kvp., no filter, 30 cm. distance, two fields to the face, centering over the zygoma on each side, shielding the eyebrows, lids and lashes, 80 r to each area, once a week for 12 weeks. At least one or two doses should be given after a satisfactory response has been achieved, or early relapse is likely. Under no circumstances, with this dose, should more than 15 consecutive treatments be given. If the skin darkens objectionably at any time during the treatments, x-rays should usually be abandoned.

Circumscribed neurodermatitis. X-rays do not cure this disease, but they often alleviate the symptoms after local use of tars and the local and systemic use of antihistaminics have failed. X-rays should be used reluctantly and cautiously, however, in this disease, especially in young patients; patients past 65 or so have less to fear from late radiation sequelae and may be treated less reluctantly. A dose of 80 to 100 r, unfiltered, once a week for five to 10 weeks would be suitable for most cases.

Plantar warts. For solitary plantar warts 15 mm. or less in diameter, x-ray therapy is the treatment of choice—once: it isn't safe to repeat

| Diameter of Port in MM. | Dose in Roentgens | Diameter of Port in MM. | Dose in Roentgens |
|---|---|---|---|
| 14 | 1000 | 8 | 1870 |
| 13 | 1190 | 7 | 2040 |
| 12 | 1360 | 6 | 2210 |
| 11 | 1530 | 5 | 2380 |
| 10 | 1615 | 4 | 2720 |
| 9 | 1700 | 3 | 2890 |

Single Dose of X-rays for Various Diameters of Port. (After Pipkin, et al., *South. Med. J.*, 42:193 (March) 1949.)

it. The lesion should be pared down with a sharp scalpel to the point of bleeding or pain or both, partly for positive diagnosis, to expose the pathognomonic elongated capillary loops (the "seeds") which are never found in plantar corns, and partly to enhance penetration of the x-ray into the lesion. Bleeding may be stopped by the application of any convenient styptic, such as 20% silver nitrate solution or bichloracetic acid. The diameter of the wart is then measured in millimeters, and a hole cut in heavy lead foil, large enough to leave a 1-mm.-wide zone around the wart. Unfiltered radiation is then used through this lead shield, in a dose determined from the accompanying table. Time may be saved by the use of a shorter anode-skin distance: at 15 cm., the time required will be one-fourth that needed at 30 cm., for the same dose. Don't repeat the treatment, and don't apply it to plantar corns.

SUMMARY AND CONCLUSIONS: Superficial x-ray therapy is a valuable adjunct to other methods of treatment of dermatoses.

It is potentially dangerous; it is not a substitute for accurate diagnosis or other methods of treatment; it is by no means suitable for all dermatoses; there are definite contra-indications to its use.

Its use automatically increases the cost of your malpractice insurance.

If you're going to use it at all, be sure you understand it and be sure you have your equipment accurately calibrated and your indications and contra-indications clearly in mind.

(881 So. Hotel St.)

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## Proposed Section on Medicine in Industry

DR. STANLEY H. OSBORN, Section on Preventive and Industrial Medicine and Public Health, presented the following resolutions which were referred to the Reference Committee on Sections and Section Work, with the approval of the Council on Scientific Assembly to be requested:

"Whereas, It is the desire of the Section on Preventive and Industrial Medicine and Public Health that the words 'and Industrial' be omitted from the title of the section; therefore be it

"Resolved, That the title of the section be changed to Section on Preventive Medicine and Public Health."

"Whereas, The members of the Section on Preventive and Industrial Medicine and Public Health desire with other members of the American Medical Association to have a section established for all members interested in medicine in industry; therefore be it

"Resolved, That a new scientific section be established under the name of Section on Medicine in Industry."

—From the Proceedings of the San Francisco Session, American Medical Association, June 26-30, 1950, as published in *J.A.M.A.*, 143:12,1079 (July 22) 1950.

# Influences of the Unusual on Plant Medical Activities

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IN MOST considerations of injuries, it is the compensable cases that receive the greatest comment. Minor injuries and illnesses requiring treatment in the plant dispensary usually are responsible for a greater loss of man-hours and production than are the major injuries. When a serious injury is sustained, the employee is replaced, ordinarily, during his period of disability, and work proceeds as usual. However, if 20 workers report to the dispensary for minor ailments during an eight-hour period—allowing five minutes to reach the dispensary, 10 minutes for treatment, and five minutes to return to work—a total of six and three-quarter hours is consumed. During the time required for an employee to report for treatment, a relief person generally takes his place. He probably will be a "jack-of-all-trades," and will work in the department needing him most at the time. Therefore, it seems logical that he cannot be as efficient as the one who is working on the job every day. This, of course, slows production in the department during this time.

In addition, a plant may have but a few major injuries during the year, while having many minor ones daily.

An attempt is made in this review to identify the chief causes of minor injuries and illnesses in a plant of about 300 employees, engaged in the making of cookies and crackers.

RUMOR OF A LAY-OFF: A lay-off may affect more than one department, and the plant "grapevine" always spreads knowledge of the change before the official announcement from management. Temporary lay-offs, occurring frequently over a period, cause employees to feel insecure. This is manifested in the increased incidence of headaches, gastro-intestinal disturbances, and minor lacerations and burns. Some of the reasons helping to promote these rumors are lack of orders, lack of materials, or machinery breakdowns. Frequently rumors are started, but the cause is remedied before the occurrence of the lay-off.

DOMESTIC AFFAIRS: Increased expenditures for holidays, such as Christmas and Easter, give employees reason for worry. If thoughts are centered on financial and domestic worries, accident-proneness develops because of the divided attentions. If the concern is a serious one, lack of sleep and poor personal hygiene may result. This is dangerous, for a sleepy person is inattentive on the job. In attempting to cut living costs, one is likely to cut down on food expenditures, thus lessening his resistance to infections through impaired nutrition.

WORKER INADEQUACY: Feelings of physical or mental inadequacy of a person eventually will lead him to attempt to bluff his way through work. If the bluff fails, he suddenly is likely to sustain a great number of minor ailments, of insufficient severity to remove him from the job permanently, but enough to give him a respite when the "going gets tough."

INDIFFERENCE: When the employee feels frustrated or resentful, when the struggle to keep up is too great, or when there is no chance for advancement, accidents and injuries will appear. A serious major injury may follow a series of minor ailments.

MANAGEMENT CHANGE: With a change pending in managers, uncertainty and insecurity develop. The employee wonders what the new manager will be like—what changes in routine will be made—will he adjust to the employees or, what is much more likely, will they have to adjust to him? These are but a few of the questions arising in the minds of employees.

IN surveying the incidence of minor injuries and illnesses, the daily medical records were compared with production records which showed the departments working. In the figures following the two factors of "total number of dispensary visits for minor ailments" and "total number of plant departments not working" were compared under different circumstances, as will be shown. Departments not working are those having undergone a complete shutdown.

In January, 1947, the company changed from three shifts to one. By February the effects of the work change had subsided, and in Fig. 1 are shown the inter-relationships of lay-off rumors and dispensary visits. In nearly each instance in which there is an increase in minor cases at the dispensary, there is, within a few days, an increase in the number of departments not working. These facts were apparent throughout the entire year.

As the holidays approached, orders increased and all departments were working. However, immediately before Easter, Thanksgiving, and Christmas, the number of minor cases once more increased. On these occasions it appeared after some study that the underlying cause was worry over holiday expenses. In Fig. 2, the eight-week period immediately preceding Christmas illustrates this point. Although work appears to be fairly steady, the injury figures take a climb before the Thanksgiving and Christmas holidays.

During the summer of 1947, with work at a rather steady level, there was a sudden increase

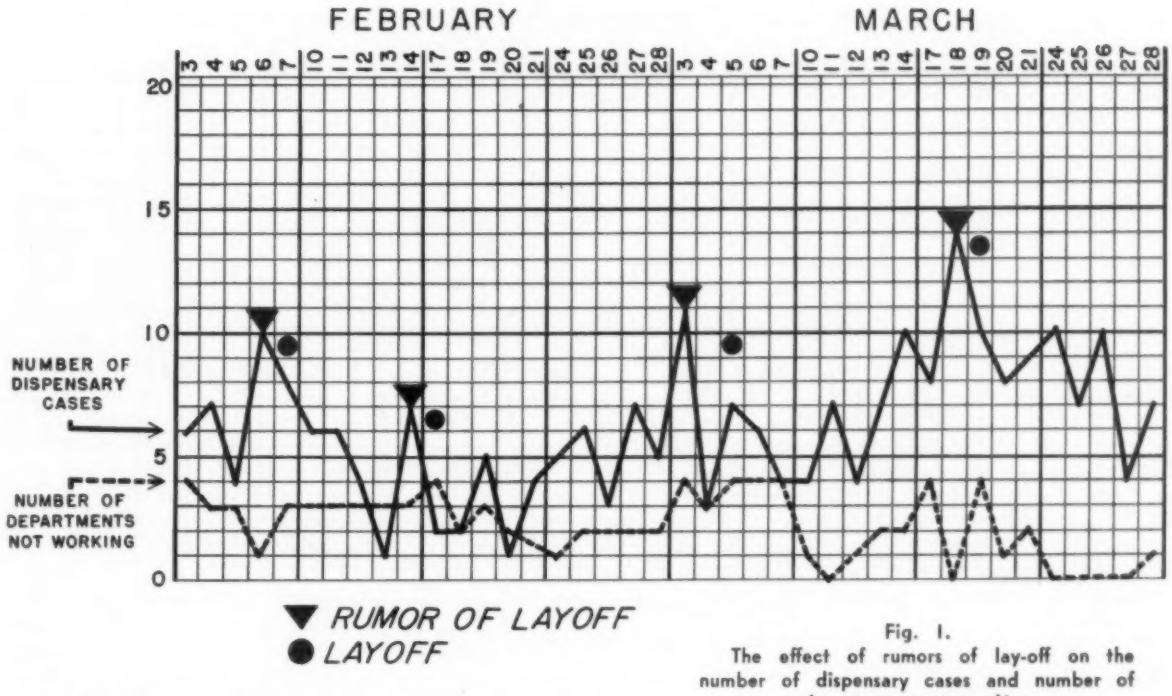


Fig. 1.
The effect of rumors of lay-off on the number of dispensary cases and number of departments not working

in visits because of minor ailments. On review, it was found that during this period (see Fig. 3) changes occurred in top management. A definite sense of insecurity seemed to exist among all personnel. This period of unrest lasted from mid-July until September when the new plant manager arrived. When the employees became acquainted with him and his routine, the number of cases returned to the normal daily average.

To end these fluctuations is not possible, but partial remedies can be worked out to minimize the man-hours lost. Elimination of the grapevine cannot be accomplished in an institution where people work together and under supervision. At times, however, it can be used as an instrument for good as well as for gossip. As an indirect means of health education it has proved invaluable, and one employee's speaking of help received can sway the plant—comparably, one unfavorable comment can do unlimited harm.

The plant nurse, by having the confidence of the employees, can, on many occasions, help the workers by listening to them speak of their troubles. A willing ear and an understanding word can do much more than medicine with

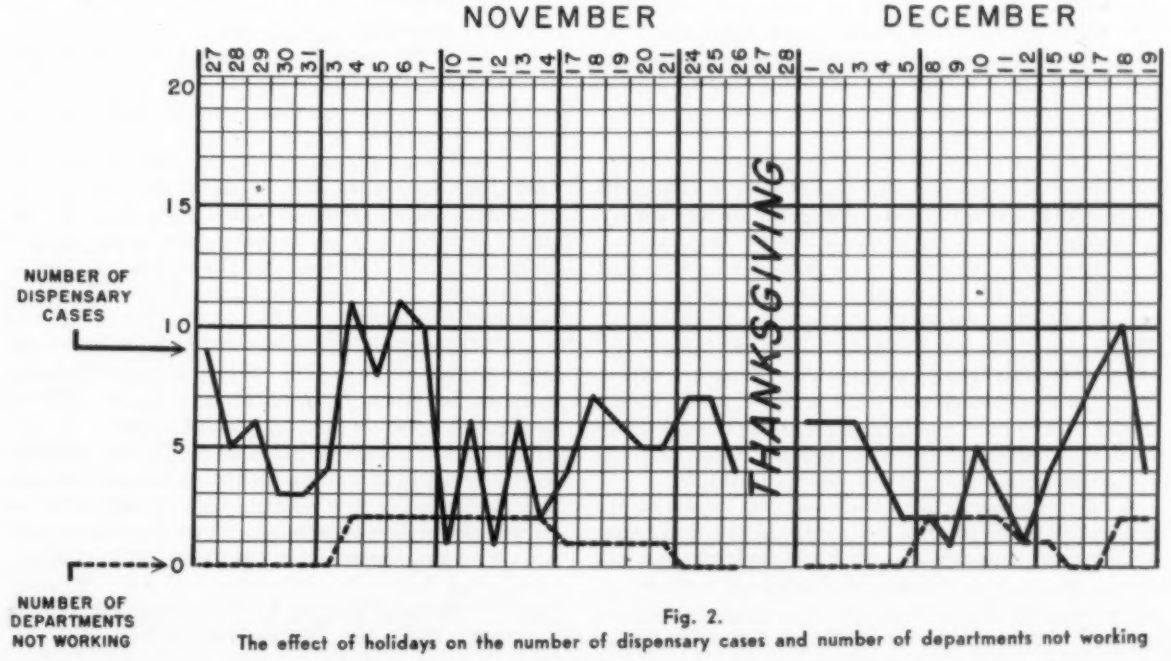


Fig. 2.
The effect of holidays on the number of dispensary cases and number of departments not working

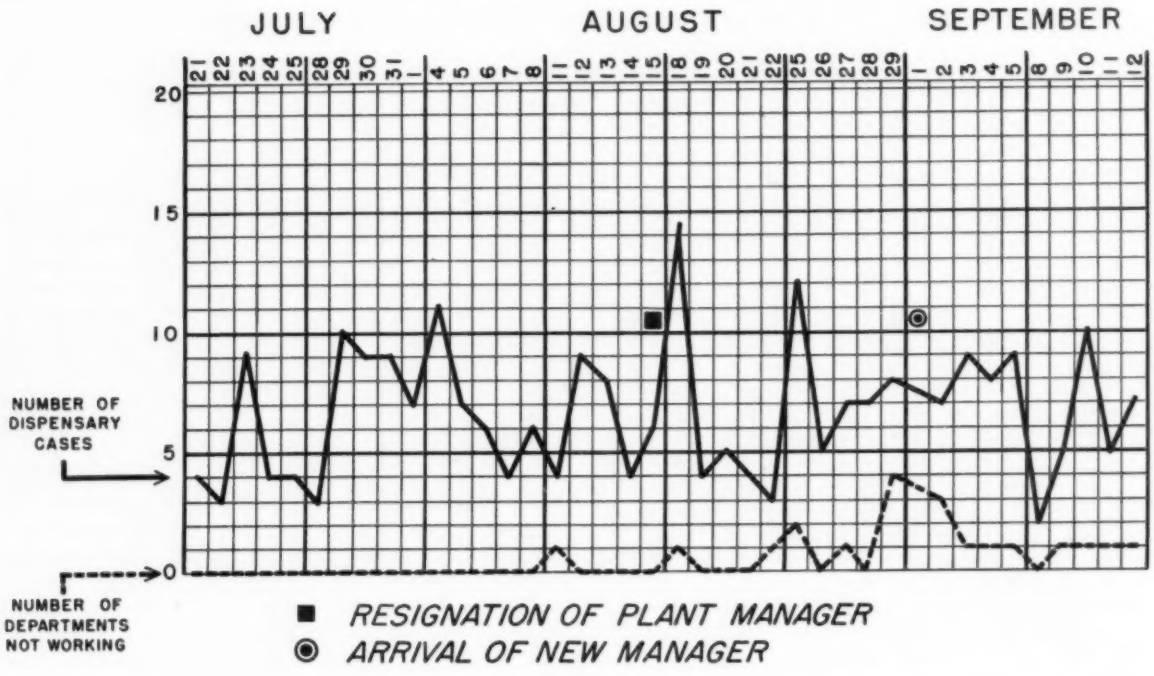


Fig. 3.
The effect of managerial change on the number of dispensary cases and number of departments not working

most of these employees. A problem loses size when brought out into the open for free discussion, and frequently one's perspective will change entirely on presenting the problem to someone else for counsel. Often, with the change in perspective, a solution will present itself suddenly. The company nurse does not need to give advice—it is better if she refrains from this—but merely needs to listen. Her professional status inspires confidence. If she ever breaks this confidence, she will lose all rapport with the workers.

Many times the industrial nurse can act as a buffer between management and labor, and in a quiet tactful way can assist in solving certain problems. As she has the trust of the employed personnel, she should know how to use the grapevine for the good of all.

If an employee comes in for medical care extremely frequently the observant nurse will endeavor to seek a cause. Many times, on simple interrogation, the worker will talk of his troubles, and if a job change seems indicated that will benefit both employer and employee, the nurse can make this recommendation to management. There must be an understanding, however, between the Medical Department and management that these recommendations will be made in an effort to alleviate a job problem and that no diagnostic or personal information in regard to the employee will be expected from the nurse.

The position of neutrality of the nurse in industry can be maintained only through impartiality and cooperation. In this position she can serve as an instrument for health education for all groups in the community, for the information gained at the plant can be taken home for application by the worker's family. The effects then, of constructive industrial nursing, can be felt at points distantly removed from the work scene.

## Summary

MINOR illnesses and injuries cause a greater loss of time from work in the small plant than do the major events causing dispensary visits.

2. Rumors of lay-offs, domestic problems, feelings of inadequacy on the part of the worker, indifference or disaffection, and changes in management will increase the number of visits made to the dispensary for minor ailments.

3. The incidence of dispensary visits was compared with the number of departments working in a small plant, and the effects of lay-off, rumors, holidays, and managerial change were demonstrated by graph.

4. Rectifying these fluctuations and dispensary work load increases can be accomplished by the industrial nurse through: (a) utilization of the plant grapevine in a constructive and positive direction; (b) listening to the employee tell of his troubles; (c) identification of the causes of repeated dispensary visits; and (d) serving as a buffer between management and labor in effecting better working relationships through recommendations for job change made without disclosure of confidential information.

5. Through a close rapport with the workers the nurse in industry can serve as a health education medium for the community, for information gained at work will be taken home for family use.

6. The industrial nurse can aid both management and labor to correction of the "human-caused" factors leading to lost production time.

(61 W. Union St., Wilkes-Barre, Pa.)

# Occupational Disease Manifestations in Dental Impairments

CAREY P. McCORD, M.D.,
Detroit, Michigan

NO PORTION of the body is spared possible invasion by some occupational diseases. Some synthetic rubber workers may lose the hair of their head, while some workers in arsenic may grow enormous callouses on their feet. It then follows as prospective that some occupational disease will involve dental and other oral structures. This is so true that mere listing rather than detailed comment would preempt all available time.

## Dental Stigmata

IN PROBABILITY, no major occupational affection is exclusively limited to dental tissues. However numerous work stigmata, the lowest grade of industrial impairment, are wholly dental affairs. These telltale markings may do little more than reveal a particular trade, but should provide mild piquancy to the day's stint. The best known stigma is the tack spitter's teeth. That worker, usually in the upholstery trades, takes a mouthful of tacks, works a number of heads out between the teeth, then one by one picks up these tacks with a magnetic hammer—and so through the day. These teeth become in time evenly serrated so as to resemble a miniature hack-saw. Oddly enough, decay is uncommon. The glass-blowers are a little different, and different among themselves. Some are specialists in holding their gathering tube in a fixed position in the dental midline, thereby in time providing identification of their trade in an evenly round hole involving four front teeth and a little smaller than a dime. Others move their blowing tubes over all front teeth and thus wear down the entire lot. The brush bristle biter and the seamstress thread biter usually devote only two teeth to their work and thus introduce their trades to the dentist. The bugler and cornetist spare the biting surfaces but affront anterior surfaces and more area along with labial corns. In the so-called "gritty" trades, the shaping of pearl buttons from shell pearl is one often carried out under somewhat primitive operating conditions. These button workers are credited with having well eroded teeth with chief involvement of the molars.

## Breath Odors and Occupational Diseases

DENTISTS function in a world of odors, many of which are obviously unrelated to occupation. On occasion, breath odors disclose exposure to harmful agents, but in themselves furnish no final proof of actual disease. Most of the gases and vapors that enter the body through the lungs are also eliminated by the lungs. Any odor of carbon tetrachloride, trichloroethylene, benzol, or naphtha should prompt referral for medical consideration. So also of possible significance is the garlic-like odor among workers in arsenic, selenium, tellurium, cyanides, and some higher alcohols, such as allyl. The possibilities are legion.

## More Important Occupational Diseases

THE FIRST great victory over a direful occupational disease was closely akin to the dental realm. Before and near the turn of the century, phosphorus poisoning was of common occurrence in this country and in Europe. The two industries widely involved were match making and fireworks manufacture. The offending agent was yellow phosphorus, while red phosphorus is near harmless. Phosphorus entering through carious teeth led to gross necrosis of the maxillary bones as one prominent feature of the condition. This mutilating disease was well known to the public as "phossy jaw." Its banishment after years of effort was chiefly accomplished by prohibitive rates of taxation on matches made from yellow phosphorus. The present day safety match contains phosphorous sesquisulphide which is comparatively harmless. The fireworks industry long has been a dying one except as a military enterprise, which fact more than any other single one accounts for the abatement of phosphorus poisoning in that industry.

Benzol poisoning is less frequent than was true 20 years ago. Numerous instances have occurred in which the first indication was hemorrhage within oral tissues. One of the distinct features of benzol poisoning is damage to the body's antibodies. Little resistance to bacterial invasion exists. Explosive gingivitis of unaccountable origin with or without hemorrhage in an industrial worker, always should be appraised in relation to occupational disease. Mercury poisoning long associated with stomatitis, salivation, metallic odors, and denuded teeth no longer is likely to appear with frequency in industry. There the type runs to chronic involvement with prominent manifestations running to central nervous system impairment, with tremors as an outstanding symptom.

In the world of occupational diseases, significant damage from acids, both mineral and organic, may have been underestimated. Much work is now under way. What has never been overlooked is the gross dental erosion in acid trades. All old-time exposed workmen are prone to present some degree of generalized erosion, with gross impairment being common. Irregularly these eroded teeth are signally free from caries or from gingival inflammation.

The widely used trichloroethylene is known to have a predilection for attack on the trigeminal

Presented at the Seventh Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS, Chicago, April 26, 1950.

nerve. In fact, it has been extensively employed through injection into that nerve for the alleviation of trifacial neuralgia. As a rare happening, atrophy of that nerve after industrial exposure to trichloroethylene, occurs with some or all teeth becoming necrotic—clearly an occupational disease.

Dental fluorosis may not occur from industrial exposure to fluorides. Occurrences have been claimed but this affection appears to be limited to juvenile years. However, in industry, dental fluorosis may be detected from earlier drinking of water from high fluorine areas.

Without equivocation, the recognition of a lead line in the gums should receive prompt medical attention. The lead line is not diagnostic of lead poisoning but only of lead exposure. Some other substances, such as bismuth, may provide a gingival line somewhat similar to the true Burtonian line of plumbism.

Dentists may find themselves consulted by patients complaining of the loss of the taste sense. When the matter unfolds, it frequently comes about that the difficulty resides in the loss of smell. Without smell, taste is a weak sense. Blindfolded and with our noses compressed, none of us might be able to distinguish between cubes of raw potato and turnip placed in our mouths. Should the test fail, remember that odors may reach the nose through the posterior nasal passages. Many industrial chemicals are known to modify the taste by olfactory damage. The number includes arsenic, zinc sulfate, zinc chloride, and acids. Anything that caused edema of the nasal mucosa to the point of submerging the olfactory terminals may modify taste.

It is a part of occupational disease tradition to believe that bakers and confectioners are afflicted with dental defection, peculiarly of occupational origin. In Germany, it long was a commonplace saying that "The gingerbread maker has no teeth." A hundred percent frequency has been mentioned for Belgium's bakers, and two years is reported as sufficient a period of employment for defects to appear. Moreover, the type of caries is set forth as unusual in character, unlike customary caries.

Lastly, in this recital, is an oddity—an example of stark injustice. The early maker of artificial dentures lost his own teeth. Rubber was compounded with carbon bisulphide and colored with cinnabar which is mercury sulphide. Thus, between the carbon bisulphide and the mercury, out came his own teeth, thereby becoming a self-customer for his own wares.

If this comment may serve any useful purpose, it will reflect the need that continually the dentist, the physician, and the industrial hygienist pool their abilities to the end that no occupational disease may be overlooked.

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## Sunbathing

FOR MAXIMUM benefits and minimum dangers in sunbathing, these suggestions are offered in an article in the current (July) issue of *Today's Health*, published by the American Medical Association. (1) Start with 10 minutes of exposure to sun on the first day. By increasing exposure time 50% each day, a coat of tan should be acquired safely. (2) It is advisable to continue sunbathing all summer, for the beneficial effects of the ultra-violet rays will continue despite the deepened color of the skin. (3) Morning hours have been found most effective for acquiring sun tan. The hours between 11:00 A.M. and 2:00 P.M. are most dangerous. (4) Ultra-violet light may be as intense on misty or cloudy days as in direct sunlight. It can cause severe burning. (5) The notion that skin burns more readily when wet is a mistaken one. Sunbathing in shallow water or on the shore of a lake or the ocean is more likely to produce a burn than sunbathing away from the water, however. The sun's rays are reflected from the water, which intensifies their strength. Reflections from snow or ice are even more potent. (6) Lasting injury may be done if the eyes are not protected from the sun's rays. Dark glasses made of ground glass or several thicknesses of cloth over the eyes may be used. (7) Drinking plenty of water or other liquid when sunbathing is essential. Sunstroke is due to dehydration. Salt tablets are valuable, for salt tends to hold water in the tissues. (8) After a sunbath, be sure to cool off completely before plunging into cold water. Heart attacks sometimes result from such sudden changes, which put too great a strain of adjustment on the circulatory system. (9) Children's skins are more tender than those of adults. Naps and planned diversions in the shade or indoors are excellent for youngsters who tend to play too long in the hot sun.

—A.M.A. News Release.

# ASSOCIATION NEWS

## The Chicago Conference

THE 1950 Conference at Chicago is now history, and can be viewed in retrospect. All of the five participating groups were well represented, and all the meetings were well attended. The medical and surgical clinics on Monday afternoon and Tuesday morning at St. Luke's and Cook County hospitals were filled to capacity. Although the plant tours were not specially featured, they were popular. The open-house invitations throughout the week made it possible for those interested to go at their most convenient times, and nearby plants were visited by 149 physicians and 162 nurses. The plant tours for the industrial hygienists also proved popular. Four Hawaiian Association members attended the Conference, accompanied by their wives and, in one instance, the family. These were DR. and MRS. SAM WALLIS, Kaunai; DR. and MRS. JOHN A. BURDEN and family, Maui; DR. and MRS. WM. H. WILKINSON, Lanai; and DR. and MRS. T. D. WOO, Hawaii. In some respects the 1950 conference *made* history, especially in connection with the Section meetings held on Tuesday afternoon. These were so well attended, and so thoroughly did they come up to expectations, that they will undoubtedly be a feature of future Conferences. One example of their popularity was the Section meeting on Hand and Restorative Surgery. In 1949, at Detroit, this meeting had about 35 present. In 1950, at the Sherman Hotel, the Section was given a meeting room which would hold 125, but, to the surprise of all, more than 250 persons attended, filling the aisles and standing along the walls and in the doorways. In planning the 1951 Conference at Atlantic City, the effort will be made to schedule the Section meetings for different days.

## The Atlantic City Conference

TURNING from the past to the future, the first preliminary planning meeting of the five participating groups for the 1951 Conference at Atlantic City, April 23-27, was held at the Association offices at 28 East Jackson, Chicago, on July 23. The participating groups were represented as follows: The AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS by KEN MORSE; the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION by ALLEN D. BRANDT, ANNA M. BAETJER, VAN HENDRICKS and WILLIAM R. BRADLEY; the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES by HAZEL BECK, R.N.; the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS by GRAHAM DAVIES, D.D.S.; and the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS by H. GLENN GARDINER, M.D., EDWARD H. CARLETON, M.D., EDWARD C. HOLMBLAD, M.D., and STEPHEN G. HALOS.

## Nasatir Memorial Fund

THE California Conference of Governmental Industrial Hygienists announce the inauguration of a project to commemorate the pioneering work in industrial health in Los Angeles of DR. A. VICTOR NASATIR. They have submitted to the Biomedical Library of the new U.C.L.A. Medical School a list of books for a basic library in industrial health. Together with the Southern California Industrial Safety Society, they have collected $65 and another $50 has been pledged, bringing them with $100 of the goal. If any A.A.I.P.&S. members wish to contribute, checks should be made out to MR. WM. V. CARDILLO and marked "Nasatir Memorial Fund," then mailed to California Conference of Governmental Industrial Hygienists, Room 621, 808 North Spring Street, Los Angeles 12, California.

## Tree-Pruners

TREE PRUNING is ranked as the thirty-fourth most hazardous among 584 industries rated by the Compensation Insurance Rating Board. Tree pruners of the New York City Park Department had a 1949 accident rate of 30.93 per million man-hours; the accident rate for all industries combined was 11.49. —*New York Herald-Tribune*, July 13, 1950.

## Laboratory Hazards

DRS. S. E. SULKIN and R. M. PIKE, of Southwestern Medical College, University of Texas, are conducting the first comprehensive survey to be made in this country of the incidence of infection among laboratory and research workers. They will present the results of their survey to the American Public Health Association at its annual meeting in St. Louis, October 30 to November 3.

## No Chance

SEVERAL months ago a small article appeared in one of the "trade journals" telling the story of one physician who wagered that if his colleague would write a letter to the President denouncing socialized medicine, he too would be invited by the Department of Internal Revenue to explain the figures on his form 1040 for the year of 1946. The experiment was conducted and the results were as predicted. This may be construed to imply political persecution of the medical profession. It *may*, however, have been pure coincidence. —*Pennsylvania Med. J.*, May, 1950.

## Gulf Coast Regional Conference

OCTOBER 12-14 are the dates of the third annual Gulf Coast Regional Conference on Industrial Health, Rice Hotel, Houston, Texas. The conference is being planned for the benefit of representatives of the medical profession, industrial nurses, safety engineers, public health departments, insurance companies and utility, sanitary and chemical engineers.

## Is He?

IS THE drunk lying in the gutter of Skid Row actually suffering from a disease just as terrible as cancer or tuberculosis? Is he any more responsible for being an alcoholic than the little girl in the wheel chair is responsible for being a victim of polio? Because these and other questions on alcoholism are still to be answered, the University of Wisconsin Extension division, in cooperation with the Wisconsin State Bureau of Alcohol Studies, is sponsoring a Summer Session of Alcohol Studies at Madison, Wisconsin, August 21-26.

# INDUSTRIAL MEDICINE IN THE PUBLIC EYE

## Special Medical Report
## American Industry Cares for Its Sick

(Newsweek, May 22, 1950)

ON THE wall of a spacious room on the 24th floor of the RCA Building in Rockefeller Center, New York, there hangs a multicolored map of the world. Black ribbons fan out from a pin on New York City to spots ranging from Norman Wells, Canada (about one degree below the Arctic Circle), to Plaza Huincul in Southern Argentina; from Houston, Texas, to the city of Palembang in Indonesia. The map measures the size of Standard Oil of New Jersey's medical program—the health care of 285,629 persons: 137,652 domestic employees and 145,977 employees, their families, and others outside the United States.

Dr. Robert Collier Page, the tall, blue-eyed medical director, has visited all the medical installations of Standard and its affiliates. Two of his staff doctors are on instruction tours around the world.

"But we are not inspectors," said Bob Page, "we're constructive doctors. What we are trying to do is to keep each Standard employee at the peak of health by searching for signs and symptoms of disease before it becomes firmly established. Then we teach him to live within his own physical and mental levels."

Problem cases are reported to Dr. Page and his staff of 46, including 11 doctors, from all over the globe. An American employee might be flown up to New York from Ecuador for treatment; another might be sent to the Standard medical installation at Aruba, Curacao; a third might be treated while aboard one of the fleet of Esso oil tankers. Besides caring for the 1,600 Standard workers in the RCA Building, Page's staff can easily handle the medical care of any other Standard employee in the world.

From the frontier days, American medicine has healed working people. Laborers with cuts, burns, and bruises used to be warned that "the worst thing a meddlesome man can do is to cleanse his hurt by water, or worse still, by soap and water" (*Railroad Gazette*, 1879); doctors prescribed shellac or molasses for cuts, black engine oil or powdered charcoal for burns, and a mixture of vitriol and water for sore eyes "to positively effect a real cure in a short time" (*American Railway Journal*, 1834).

Last week, with some 60,000,000 persons at work in the United States, their aches and pains, whether mysterious industrial ills or common diseases, were mounting medical problems. Each week at least 1,000,000 workers are absent from their jobs because of illness. One-fourth are out with colds, even at this season of the year, and 15 to 17% with flu or grippe. Other main ailments are diseases of the stomach, pharyngitis and tonsillitis, heart and artery diseases, rheumatism, arthritis, gout, and menstrual disorders of women. Women are more likely to be sick than men (they miss about 11.8 days a year compared with 7.5 for men).

In addition to these common ailments, there is a whole rash of industrial diseases ranging from poisoning by lead, gases, and assorted chemicals to lung infections from coal, granite, and fur.

THE HELPING HANDS: How well are these 60,000,000 people cared for by American industrial medicine?

The United States Public Health Service estimates that only 30 to 40% of them get some kind of care connected with their jobs—from in-plant dispensaries or industrial or union medical plans.* More than 2,000,000 workers are served by plans sponsored by industry, or industry and workers both; another 3,000,000 by plans set up under collective bargaining with unions.

Only a few programs are paid for entirely by management or by unions. Usually the cost is shared by both management and workers, who may chip in anything from 1 to 5% of their monthly pay.

Coverage for these 5,000,000-plus ranges in a very few cases from complete care, such as Standard Oil's, to treatment only for ills resulting from the job. The bulk of the medical care lies part way between, with emergency treatment and short-term hospitalization.

WORKING ON THE RAILROAD: The first big American business to go in for workers' medical plans was the railroads. They began in 1834, when the Baltimore & Ohio hired a hard-working doctor named James P. Quinn, of Harpers Ferry, W. Va., to care for some construction laborers.

Today virtually all the major railroads give free on-the-job emergency treatment to some 900,000 employees, plus more elaborate hospitalization through pre-payment health plans. The railroads own and operate some 36 hospitals in 22 states with 4,000 beds that handle 96,500 patients a year. They hire 16,000 doctors, most of them part-time. The workers pay anywhere from $1.50 to $5 a month, which covers about half the cost of the plan, with management paying the rest.

Other important industry-sponsored health plans are the Kaiser-Permanente Hospital at Oakland, Calif., and the Northern Permanente Foundation at Vancouver, the health departments of the Tennessee Coal, Iron & Railroad Co., Birmingham, Alabama, and the Colorado Fuel & Iron Corp., Denver; the Roanoke Rapids Hospital and Employees Medical Fund at Roanoke Rapids, N. C., and the medical set-up of the Consolidated Edison Co. of New York.

The trend in the last year or two has turned to more medical services won through collective bargaining with the unions. Many of the plans listed above are now included in bargaining agreements. Permanente, for instance, now is under collective

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*Countless other workers have some health insurance, such as the Blue Cross, not directly connected with their office or factory, or health insurance contracts between the plants and insurance groups like the Blue Cross.

bargaining; Consolidated Edison is also covered by agreement. In Detroit, Ford, Kaiser-Frazer, and other groups have set up plans in bargaining with the United Auto Workers, some of them including contracts between management and outside groups such as the Blue Cross.

The chief union medical plans include those of the International Ladies Garment Workers, the Philadelphia Union Health Center, the Amalgamated Clothing Workers, the United Mine Workers, and the Union Health Center in New York City.

BIG MONEY AND SUPER-CARE: Big business has always known that it is good business to preserve the good health of its workers. (Some 500,000,000 man-days of labor are lost every year through illness, and that means a loss of about $10,000,000,000 annually.)

In 1948 the International Harvester Co. invested $18.72 in the health of each of its 90,000 employees. Total cost to the company for medical care and compensation amounted to $1,684,556.16. But the big investment paid off. Less than 3% of the workers suffered lost-time accidents.

The Bethlehem Steel Co. spends $1,500,000 annually on the health of its 143,000 workers. General Motors employs 115 doctors and 600 nurses to serve some 300,000 people at 100 plants in the United States. Among the other companies with superior medical plans and large research programs are the United States Steel Corp., American Telephone & Telegraph Co., Westinghouse Electric Corp., Western Electric Co., and the two big packing firms, Swift and Armour.

E. I. du Pont de Nemours & Co., pioneers in industrial psychiatry, have added a model mental-health program for distressed employees to their medical department. Other companies which have recognized the need of psychiatry as a partner in preventive medicine are American Cyanamid Co., the Metropolitan Life Insurance Co., and the Eastman Kodak Co. Alcoholism, as an industrial problem, is now being handled medically by the Allis-Chalmers Manufacturing Co. of Milwaukee.

Some industries, such as the United Fruit Co., have been forced into the field of tropical medicine by their own plant environment. When United Fruit established its first medical unit at Bocas del Toro, Panama (then Colombia), on Aug. 23, 1899, the Central American ports were closed because of yellow fever, plague, and smallpox.

"Economic disaster could only be averted by effective medical and sanitary service," Dr. Edward I. Salisbury, United Fruit medical director, reminisced. Fighting the sources of malaria, yellow fever, and other diseases among the banana plantations, mostly reclaimed pest-laden swamplands, the UF doctors became experts in pioneer tropical-medical research.

In fact, they eliminated yellow fever before the Canal Zone did.

Today, in addition to the modern medical plant in New York, United Fruit has 13 hospitals in Cuba and Central America. Besides, it has a health plan which covers every employee so completely that no UF worker need ever worry about doctor, hospital, medical, or surgical expenses so long as he is employed by the company. There is no charge for this service and if the employee wants to include his family, he can pay a small flat sum for the same benefits.

All in all, the tropical-medical program, plus disease control, costs United Fruit about $2,500,000 a year. But it is worth it. Although no statistics are available, mortality rates of UF workers in the tropics are spectacularly low compared with native rates. So successful is the health service that insurance companies now give North American employees of United Fruit living in the tropics the same rates as North Americans at home, all things being equal.

HEAT, FUMES, AND POISON: Twenty years ago, the manufacture of rubber was regarded as one of the most hazardous to the lives of its workers. Today most of the problems have been ironed out by such pioneers as the United States Rubber Co. Dust checking, air sampling, and toxic-material examinations have cost millions, but they have been worth the expense. During the war, for instance, in United States Rubber Co.'s seven munition plants with a total of 100,000 employees, there was not one fatality as a result of fire or explosion.

Besides its large domestic health plant and research laboratories, United States Rubber extends medical care to at least 60,000 natives on its 131,000-acre plantation area in the Far East. Typical of these is the Malayan central hospital, situated at Dublin Estate near Kulim, with 210 beds and a staff of 35, including native "dressers" or assistants. A dresser is a native who has received some medical training. Besides assisting in hospital work, he "rides the circuit" through plantations, giving first aid and dispensing medicine.

THE AILING EXECUTIVES: Since 1949 Consolidated Edison executives have undergone periodic health examinations as part of a preventive program. Diseases uncovered in approximately 25% of the persons examined were abnormally high blood pressure, hardening of the arteries, and heart ailments.

At Kaiser-Frazer's handsome Willow Run hospital for employees, the youthful Dr. Clifford Keene keeps a vigilant eye on K-F executives, including "Henry J." himself. "Executives are our most valuable bits of machinery," Dr. Clifford remarked. "You can't buy a new sales manager."

The Ford Motor Company also takes an interest in the health of its top men. At the River Rouge hospital, one of the world's largest industrial health plants (70,000 men and women treated by a medical personnel of 180; 28 medical centers and 35 first-aid stations throughout the country), executives are encouraged to take a yearly physical examination with Ford paying the bill. General Motors also has its executives very much in mind. Last year 2,491 bosses had complete physical examinations "on the company."

At the Chrysler medical plant, the bluff and burly Dr. John J. Prendergast, former chief surgeon and superintendent of Detroit's Receiving Hospital, directs the activities of 162 doctors, nurses, and technicians.

Chrysler does a spectacular job of rehabilitating the sick and ailing by keeping them on the job, even while they are getting well.

Arrested tuberculosis cases, diabetics, epileptics, and heart defectives are checked at intervals to see that their ailments have not been aggravated. "People with defects can be employed with no more risk than those without so long as you follow them up," Prendergast concludes.

THE WEAK SPOTS: While many of the big-name companies provide remarkable free health care for their employees, and while other industries, such as the railroads, have excellent part-pay medical plans, these are exceptions rather than the rule. The 5,000,000 or 6,000,000 persons covered by private company care, industry's pre-payment plans, or even by collective bargaining are mostly in the large companies. The majority of the workers, in small plants scattered across the nation, are largely without medical coverage, even routine in-plant care. A study compiled by C. O. Sappington shows that of plants employing under 1,000 people, less than 50% have any sort of plant dispensary, much less a formal medical program.

Over 90% of the industrial plants in the United States employ less than 100 workers, and the vast majority of these do not have the simplest health service—not even a cigar-box first-aid kit.

One of the chief industry problems, as in any kind of medicine, is the doctor shortage. There are only about 600 full-time doctors in industrial medicine plans, although perhaps 15,000 to 20,000 are on part-time or consultation basis. For a long time, doctors feared loss of prestige among their fellows, too much regimentation by management, and lack of real opportunity. The use of medical records by management as a source of information has frequently been a sore spot with labor. But the trends are slowly shifting, with increased acceptance of industrial medicine by doctors as an important and fruitful career field.

Despite these advances, there is still considerable controversy in the field as to just how far industry should go in caring for its workers. This attitude may stem in part from a tightening budget and in part from a natural puzzlement of management as to just how much medical care the employee actually wants. (There is always the chance that the charge of "selfish paternalism" or even "welfare medicine" may be hurled at the bosses.)

Wherever the health responsibility lies, all industries agree that they are charged with the specific industrial hazards of their plant and that proper research must be done to solve these rapidly growing problems.

Well-known industrial diseases, such as silicosis, are fading, but, as the experts warn, new hazards are rising faster than they can deal with them. Much work must be done in examining new insecticides, much more virulent than their predecessors. Another significant health problem applies to radiation. Besides the potential radioactivity hazard to workers exposed to uranium, the element may be chemically toxic as well.

Then there are the chemicals handled by laborers which are strongly suspected of influencing or causing cancer. Today Dr. J. R. Heller and his associates at the National Cancer Institute, Bethesda, Md., are making a study of these environmental cancer hazards for the industrial population. In another USPHS laboratory in Washington, D. C., radiation research is being conducted, and at the Industrial Hygiene Laboratory in Cincinnati, air pollution and insecticide research has been set up.

As things stand now, the sick workers, 1,000,000 strong each week, may continue to take time out for colds, stomach-aches, and hangovers. But with industrial scientists at work in a hundred laboratories across the country, absenteeism from the severe ailments of the world of tomorrow may be minimized and industrial hazards removed from most jobs.

# LETTERS

## Field Experience

TO THE EDITORS: The following field experience may prove of interest to industrial physicians. A large construction project in our area has experienced a considerable number of puncture wounds and other types of injuries which require the administration of tetanus antitoxin prophylactically. In some instances severe side reactions from the administration of the TAT were reported. It was suggested that workers who perform jobs where such wounds are likely to be incurred be given a series of tetanus toxoid immunizations. Booster doses administered periodically could be given to maintain the level of immunity. The suggestion was favorably received by the physician in charge of the project who is taking steps to "sell" the idea to management. We are reporting this experience so that those physicians not already using this prophylactic measure may consider the merits of such a program in their industrial practice.

—M. R. PLANCEY, M.D.,
Director, Division of Industrial Hygiene,
Los Angeles County, California.

## "No Springs"

TO THE EDITORS: I would like some expert opinion on the physical disorders which may be encountered among drivers constantly employed on 20 ton-trucks in the conditions described hereunder, and on the practical means of preventing such disorders. I have been consulted by a firm which operates a large number of such trucks in several quarries, all located in Belgian Congo (Central Africa). These trucks were built in the United States. They are equipped with Diesel engines, and have enormous wheels and tires but no springs. They carry up to 20 tons of stones or ore, and are always working on very rough tracks.

The drivers are all natives. They are exposed to continual and severe shaking. No specific disorder has yet been disclosed among them but only a few drivers have been on the task for several years. Most of the drivers have been issued large leather belts (belts for motorcycle riders supplied by the Brake American Corporation) which they wear over their clothes. This helps to check whether the belt is worn or not. These belts have some sort of decoration in the Indian style, and remind me by their shape of the ones that were worn during the war by the U.S. army dispatch riders, usually mounting powerful twin-cylinder motorcycles.

Have any specific physical disorders been recorded in the United States, among drivers operating trucks of an equivalent type and usually exposed to severe shaking? Are there any statistical data on the proportion of drivers suffering from such disorders? And what are the physical disorders most commonly reported?

Do you suggest or impose, in the United States, any means of prevention? How is such prevention applied?

If a belt is considered a valuable item, do you approve the model we have used up to now? If not,

what type of belt do you recommend, considering efficiency, resistance to wear, price and means of checking whether it is worn or not?

—DR. GODENNE,
Kambove, Katanga,
Belgian Congo.

[READILY it may be recognized that this aspect of occupational physiology has not been well investigated, although it may be surmised that within the undisclosed records of military establishments there may be found extensive inquiry along the lines implied in the above query and particularly so with respect to military tanks. Apart from tanks, there are many work or sports pursuits involving impact shock, not the least of which derives from riding in speed motor boats. Because of the dearth of data, the answers here made are wholly preliminary and inadequate. This query, in fact this topic in general, is thrown open for comment for an indefinite period in the hope that ultimately a proper understanding may be reached.

At the lowest level it is commonplace knowledge that a person walking on hard surfaces distinctly prefers wooden floors to concrete and rubber heels and/or soles to harder ones. This promptly gives way to the negative assertion that well-hardened soldiers tramping over hard surfaces or rocky roads prefer heavy leather marching shoes and will have no others.

The present generation is so little familiar with the days of coaches and wagons with steel-rimmed wheels, that even physicians have lost account of that old disease "coachman's bursitis." The dissection of gluteal regions revealed deeply embedded large size bursae representing anatomic resentment against years of impact.

Motorcycle riders usually are equipped with heavy abdominal belts which mostly may constitute mere ornamentation, but at least these afford some degree of protection in the event of accident, and some motorcycle riders wear hard hats against head injury. Nevertheless, the claim is made by riders that these belts afford a cushioning effect helpful against impact discomfiture. This statement is also true for women who wear corsets as a foundation garment. After months of wear, they decline to discard them on the grounds of support and comfort.

There are many old statistics referable to tram car operators, baggage car attendants, motormen, chauffeurs, etc. Irregularly and inconclusively these statistics sometimes indicate higher mortality rates but so many other factors are involved that no conclusions are warranted. Over the years, claims have been made that all manner of workmen subjected to impact shock present a higher frequency of visceroptosis, hemorrhoids, hernia, flat feet, varicose veins, hepatitis, pilonidal cysts, digestive derangements, neuroses, and in the case of women, uterine displacement and menstrual disorders.

Well established is the fact that vibration tools, from the finest electrical etchers up to jack-hammers, bring about a genuine lot of abnormal states involving nerves, capillaries, synovial sheaths and bursal sacs. A direct comparison is not warranted with respect to the nature of this query since consistency of the vibration, the vibration rate and amplitude, the environmental temperature, all enter into the situation.

A somewhat different pathologic picture derives from low-speed and high-speed tools. With rapid vibration, the damage may center in capillaries but with heavy tools, such as air hammers, damage may be limited to synovial and bursal structures leading to tenosynovitis or beat elbows.

From casual examination of tank drivers during the war period, it was found in one study, despite many complaints, that no red blood cells and no albumin appeared in the urine. By arrangement, certain test drivers for tanks were granted periods of work on and off such employment, but the desirability of this is not established since inurement may be a factor of advantage.

At the present time, in this preliminary discussion the disposition is to deny many of the old claims as to the causation of visceroptosis, dislodged kidneys and such, but at once concede that all such work as that under discussion inevitably leads to excessive fatigue, to some degree of myositis and possibly neuroses.

The better and wider experience and conclusions of others are bespoken and awaited.

—THE EDITORS]

## "Let's Look at the Record"

TO THE EDITORS: In *Newsweek* for May 22, 1950, there was an interesting article on industrial medicine entitled, "Special Medical Report: Industry Cares for its Sick." We like this article, but we wish that lay writers who are describing our field of medical practice to the public would be more careful in the figures they use. For instance, the statement that "more than two million workers are served" by formal plans and another three million by "plans set up under collective bargaining," together with its implications, is completely wrong. The American College of Surgeons has already made 2300 surveys of medical programs for which the A.C.S. Certificate of Approval has been requested or awarded, and the number of employees covered by these programs far exceeds six million. Another six million—and more—will be found in connection with the many programs not yet in line for measurement by the College's Minimum Standard, but where the coverage is nevertheless effective to a degree entitling them to be included in any total estimate. The true figure is more like 15 million than five million. Why the negligible credit, when the record has earned so much more?

—MEDICAL DIRECTOR

[NOTE: By special permission we reproduce on pages 390-392 herein the article on industrial medicine above referred to.—THE EDITORS.]

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## History in Photographs

BEFORE the advent of photography, the likenesses of the famous could only be transmitted to posterity through paintings and sculpture. In their absence, we invent them. Biblical story-books and religious art are replete with drawings of all main characters and events. The visages of Adam, Moses, and even Satan, are accepted without question, but no record exists of tedious hours of sittings, and the original artists are never mentioned.

In order that oncoming generations may not be denied factual portrayals of those famous in the world of occupational medicine, ancient and modern, the Chrysler Corporation of Detroit, through its Medical Director, JOHN J. PRENDERGAST, M.D., for years has engaged in the collection and standardization of photographs and photographs of paintings of the notables within this medical specialty. Since photography is older than comprehensive occupational medicine, actual photographs are available for the majority, while, with few exceptions, the truly great among the ancients, such as Ramazzini, have been preserved in oil. The need for collections of this character is reflected in the utter unobtainability of likenesses of some relatively modern personages such as Tanquerel des Planches.

Medical sciences recognize no petty boundaries, so this Chrysler collection is not restricted to physicians, although they do dominate the series. Any historic portrait collection dealing with the major personalities and achievements in occupational medicine would be incomplete without inclusion of JOHN B. ANDREWS, the non-medical sponsor of the first magnificent preventive measure in occupational hygiene—the banishment of the devastating yellow phosphorus from the match industry after decades of havoc.

This collection starts with Paracelsus (otherwise formally known as Theophrastus Bombastus von Hohenheim), and is continuing. One hundred and fifty is the present total. Many who may read this item know that their own photographs are included. Many others not now included, during any year may be added as their attainments and contributions attract added attention.

As well may be believed, the original material represented all manner of shapes, sizes and degree of visibility. Through the Chrysler photographic department, all have been adjusted to uniform proportions and, with rare exception, good appearance. This is a standardized collection.

At the time of the 1938 annual meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, the then smaller group was displayed. Since that date provisions have not been made for scientific exhibits. After these elapsed years, the time has come when again this priceless assemblage should be shown to all, and, in particular, to the novitiates in occupational medicine, so that their distinguished professional progenitors may be a matter of visual memory.

More than one effort has been made by national agencies related to occupational medicine to procure this collection for permanent display. This is unlikely of accomplishment at any early time. This statement fathers the thought that duplicates of the entire series should be secured so that, in the event of catastrophe ruining any sole collection, still others might perpetuate their historic import.

No one man, however well informed, will be able unerringly to select any complete list from the mighty of the past who deserve photographic memorialization. More immediately, no one person holds himself infallible in selections from those now living. Accordingly, after viewing this collection, wherever and whenever displayed, DR. PRENDERGAST seeks nominations from all persons as to others who should be included, together with possible sources for photographs of those among the ancients.

Halls of fame sometimes have a way of being

started by accident. It may well be that in this Chrysler photographic collection there has been inaugurated a hall of fame in occupational medicine, to which all industrial physicians and surgeons may aspire.

## Plantation Medicine Number

THIS "Plantation Medicine Number" of INDUSTRIAL MEDICINE AND SURGERY presents the program of the Sixth Annual Meeting of the TERRITORIAL ASSOCIATION OF PLANTATION PHYSICIANS, substantially as given at Puunene, Maui, T.H., last November. This Association is the Hawaiian Component Society of the A.A.I.P.&S. Its members, as DR. ROBERT F. COLE notes (page 366), are in a unique situation, in that they are "both family and industrial physicians." Theirs is essentially a rural setting, in which the climate is salubrious and the working environment offers few counterparts of the industrial exposures encountered here. The papers, panels, discussions and abstracts on pages 341-383, furnish an interesting panorama of their medical world. While there may be little that is new in these presentations, there certainly is nothing that is old, for these Territorial Physicians are as modern as the moment in all that is recent and useful. Theirs is medical and surgical practice of high order. Whether it may be classed as "industrial" or "agricultural" could be an engaging question, but it is a question which seems headed toward becoming purely moot. The extension of industrial medical practice to the community has long been characteristic of certain enterprises, notably mining, and the inclusion of employees' families on an insured or other basis in other kinds of industry is not uncommon. Now comes the development mentioned in JOHN MCMAHON'S *Industrial Hygiene Digest* (page 350, herein) in which one effect of many of the pension plans currently popular in employment situations of all sizes is strongly suggested. Because of "disability clauses" paying a lesser pension after a shorter period than is required for full pension qualification, non-occupational diseases—arthritis; heart, kidney or lung conditions; cancer, etc.—become definitely occupational from the standpoint of cost to the employer. Thus, in their full scope of medical and surgical responsibility, the Territorial Physicians may have already defined the "wave of the future." The "unique" situation they are filling so admirably might easily contain not only the elements of prophecy, but also the groundwork for some lessons in how to do it when it has to be done here. Not the least of these lessons could involve the amicable relations existing between the physicians whose responsibilities extend into industrial medicine and those whose practices are outside of its area. Another lesson, also of more than small importance, relates to the need for industrial medicine in the agricultural industry throughout the whole country. Farm machinery, insecticides and fungicides, freezing operations and the like are posing problems for which about the only answer has been the higher insurance rates necessitated by the terrific number of claims. A third lesson might be embraced in the suggestion by MR. ALLEN (page 358) that a "bull session" between the company manager and the physician once a day would not be too often. This promises well.

## "Not Open to the Public"

THE great American medical spectacle is the annual meeting of the American Medical Association,—this year conducted in San Francisco during the week beginning June 25. While the headlines, radio, television and banners usually featured "A.M.A." as is fitting, at least 25 other national medical bodies conducted their affairs earlier, during, or later. At the same time, hundreds of groups and committees, of minor-size, but not of minor import, assembled formally or informally for appraisal or exploration of their several niches of activity. Altogether, some 10,000 physicians, with their families and guests, temporarily augmented San Francisco's population by 20,000—all sharing in America's greatest medical spectacle.

As is usual, the core of the assemblage was the exhibit area, scientific and technical, housed in San Francisco's gigantic civic auditorium. Not possibly could any person have seen all the exhibits and have understood fully all their implications without becoming well medically-educated.

On the front of the auditorium was the foreboding sign, "Not Open to the Public." That sign was necessary. There was not room enough even for physicians. There was no more warrant for public entry than for the public's viewing a thyroidectomy in the operating room. This granted necessity still is not lacking in the unfortunate. If through some miracle the country's entire adult population (instrument and microscope thieves excepted) might have passed by all the exhibits with understanding minds, then possibly the greater miracle might have been set in motion .... the elimination of all foolish fancies in the public's mind about physicians, surgeons, nurses, hospitals, fees, socialization, everything for nothing, and the devil take the hindmost.

A fundamental defection in medicine's relations with the public is that all of medicine in varying degrees always has borne the label, "Not Open to the Public." Those words affront. The writer, not wholly underprivileged, wells up with unwarranted resentment when facing a club's door bearing the sign, "For Members Only." Possibly lacking any desire to be a club member, a hatred, in unadmirable fashion, rises against any person who might emerge through that portal. Extend that emotional mal-reaction, palpably unjustified, some 50 million times from among the larger millions affronted by medicine's "Not Open to the Public," and there will emerge a measure of the volume of the public's discontent for medicine in its endless ramifications. Some of medicine's "Not Open to the Public" signs need taking down.

THE favored many, duly equipped with badges, were able to pass the barrier of uniformed officers and enter the sacred area. Within, there was provocation for minds at every level. The most erudite might delve in such items as the intricate chemistry of cortisone acetate, while those of lesser erudition might capture an armload of free samples. Everything was given away —from pencils, cigarettes, and lipstick, to magnificent automobiles. The unit number of the former exceeded the latter, but the ultimate tonnage may have been near the same. Something anomalous attends this practice of "give away" items. Commercial enterprise hands out in profusion all manner of gifts. Evidently this leads to later profitable sales, else such practice long ago would have been discontinued. For centuries physicians have been handing out free services but this only has eventuated in clamor for more and more free services, real or occult. Something is amiss in the medical procedure.

While medical masses strong-armed their way through crowded exhibit passageways, the official stalwarts—the delegates, the executive committee, the councils—earnestly went about the trying business of endless sorts, in shaping policies for the best application of medicine everywhere. Most physicians envy the honored who sit in the house of delegates or serve as officers. Few realize the endless toil, moil, and strife inescapably attending the labors of the Association's far-flung activities. Interspersed with the formal sessions of the statesmen, were their little less arduous social and public appearances—speeches, radio and television, news conferences—all in the grand manner.

All in good time, the scientists took over and carried out their scientific programs,—perhaps as many as 20 simultaneously and well scattered as to location. Always there was whispering, "We cannot offer any real newness or anything technical. We must present papers of general interest for the average physician in attendance." On looking around, one saw the same crowd that shares in all such meetings. The ones who need newness and freshness in viewpoint were notably missing. The disposition is to urge the passage of a resolution forbidding any member to attend sessions of his own specialty.

That heterogeneous section entitled, "Preventive and Industrial Medicine and Public Health," in some measure, because of its miscellaneousness, escapes the charge above implied. The loyal industrial physician attended a program devoted to general public health matters and profited thereby, and then vice versa. Just when some virtue was recognized in this catch-all grouping, there appeared, and possibly justifiably so, a plan to split into separate sections. Thus industrial medicine will further segregate itself, as will public health. Every specialist's medical world should be larger than that viewed between two spread fingers.

However profitable the A.M.A. sessions may be for those in attendance, and however this profit may be gained by the tens of thousands who are present, it becomes possible to maintain that those other tens of thousands who never or seldom attend are the ones who would gain even more. Every professional person has a direct debt to his profession. For the physician, part of that debt is the obligation to participate, for his own betterment, in the great American medical spectacle. But just imagine what would happen if, indeed, even one-third of all physicians journeyed at the same time to share in their profession's annual meeting.

WHEN the last paper had been read, the last public address made, the last reporter satisfied, the last exhibitor's charts and displays folded and packed, the last lantern slide returned to its case, and the swollen, tired feet soaked for the last time, any physician who was there may have gladly said, "All this has been a faithful portrayal of my medical world .... and I am proud of it."

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THE Eleventh Annual Meeting of The Ambulatory Fracture Association is to be held at the Gibson Hotel, Cincinnati, Ohio, October 16-19, 1950.

### College of Physicians

THE AMERICAN College of Physicians will conduct its 32nd Annual Session at St. Louis, Missouri, April 9-13, 1951. Dr. Ralph Kinsella, St. Louis, is the General Chairman, responsible for local arrangements and for the program of clinics and panel discussions. Dr. William S. Middleton, President of the College, Madison, Wisconsin, will be in charge of the program of morning lectures and afternoon general sessions.

### Minor Eye Injuries

A LARGE midwestern company which maintains well organized first aid facilities, reports that in the very "cheapest" accident — a foreign body in the eye—the cost of removing the object from the eye by a first aid nurse runs to $1.60, and, if the case requires doctor's care, the cost averages $16.29. These are usually cases where the worker went to the first aid room, received treatment, and returned to the job. The most important factors are: production time lost, department overhead cost per worker, and administrative costs.

—*Purchasing*, June, 1950.

### A. E. C. Fellowships

THE Atomic Energy Commission announces that four industrial medicine Fellowships will be offered this year "if suitable candidates can be found." The Fellowship programs include on-the-job training for doctors. Any doctor who enters the program must be cleared for security. One year will be spent in school, studying industrial medicine, and an additional year in one of the A. E. C.'s plants. At the end of the training, the Fellow may decide whether to work for the commission.

—*New York Herald-Tribune*, June 25, 1950.

### People Disappear

THE most characteristic thing about a police state is that people 'disappear.' It is difficult for the casual visitor to understand that when he enters the office of a business associate the desk in the corner is empty because the secretary who occupied it was arrested last week, or that the girl at the opposite desk is the police spy who denounced her, and who will shortly make a detailed report to the police on the visitor's conversation with the manager."

—DANA ADAMS SCHMIDT, quoted in *Time*, June 26, 1950.

### Not Medicine . . . .

THE moral and spiritual health of a people certainly is of equal importance with their physical well being. It is not American medicine which has

why let healing drag on and on and on . . .
in BURNS
slow healing WOUNDS
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(decubitus, varicose, diabetic)
renew vitality of sluggish cells
stimulate healthy granulation
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1. Behrman, H. T., Combes, F. C., Bobrutt, A., and Leviticus, R.: Industrial Med. & Surg. 18:512, 1949.
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failed to measure up to its obligations. It is not American business nor American agriculture which has failed, nor the fine, loyal working people of America who have failed. *It is the administrative arm of our government in Washington which has failed us in this generation—a government which is sick with intellectual dishonesty, with avarice, with moral laxity and with reckless excesses!* That condition we simply must change, if we are to survive as a strong, free people, and all of us—every one, regardless of what his way of life may be—shares the responsibility for changing it.

—From Dr. Elmer L. Henderson's Presidential Inaugural Address, A.M.A. Meeting, San Francisco, June 27, 1950.

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*(Archives of Dermatology and Syphilology for April, 1942.)*

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## "Shut Mah Mouth"

A MATHEMATICAL formula to detect the age of a person by his teeth has been worked out by Dr. Gosta Gustafson, of the state dental department, of Malmo, Sweden. Age can be determined within 3.6 years. The formula is based on numerical measurements of many changes in teeth connected with age, with allowance made for error: attrition, the wearing down of tooth surfaces as the result of chewing; periodontosis, or changes in gum structures; secondary dentin, or tissue which may develop around the tooth pulp in cases of tooth decay or diseased tissues; the position of cementum or bony tissue at the root of a tooth; root resorption, or the degree of destruction of cementum and dentin; transparency of the root, which increases with age. Each factor was ranked arbitrarily and allotted from zero to three points, according to the degree of development. The sum of the points, by means of a standard curve, gave the estimated age of the individual. Dr. Gustafson obtained the standard curve from a study of the teeth of 41 individuals of ages from 11 to 69 years.

—A. D. A. Release

## Selection and Placement

IT IS POSSIBLE to describe the physiological and psychological limitations of man in quantitative terms. From these data one can determine the requirements for the design of machines. Such data are valuable in the placement of the individual worker to insure the most successful adjustment of the individual to his job. This is the base on which effective programs of selection and placement of workers are constructed. There is no place in such a program for general classification of workers or jobs since the specific qualifications of the individual are to be matched against equally specific job demands. Visual requirements, speed and coordination of work, weight-lift-

ing demands, working heights, reach, sequence of presentation, readability of dials, identification and manipulation of controls are some of the characteristics of the job which can be described in quantitative terms for matching against the characteristics of the individual. To meet the unusual requirements of certain jobs, it has been necessary at times to select workers with superior qualifications who are able to withstand the greater stresses imposed upon them. In general, however, this is not a wise procedure since it is, in effect, drawing upon the reserve in human capacities. Such jobs require systematic study to determine the reasons for the extraordinary demands. By changing methods, materials, or design, a lessening of human requirements may be brought about. Specialists in industrial hygiene can make real contributions in the conservation of human resources in industry.

—From "The Role of Industrial Hygiene in Modern Industry," by T. F. HATCH, in *The Medical Bulletin*, April, 1950.

## Lead Data Available

LEAD INDUSTRIES Association, active for many years in the dissemination of factual data on lead toxicology, announces the availability of the proceedings of its Lead Hygiene Conference held in Chicago, in November, 1948. Subjects covered were "The Coordination of Industrial Medical Services," "Solubility and Particle Size in Lead Poisoning," "Air Pollution Regulations in Los Angeles County," "Aluminum and Silicosis," "The Treatment of Lead Poisoning — Past and Present," "Preventive Medical Armor for the Lead Industry," "Medical Control of Lead Workers—A State Viewpoint," "The Production Manager Looks at Industrial Health," "The Effect of Bal on Experimental Lead Poisoning" and "Urinary Porphryins in Lead Poisoning." The discussions following the papers are included, as well as a summation by ANTHONY J. LANZA, M.D., Chairman, Institute of Industrial Medicine, New York University. The proceedings, 137 pages and 33 illustrations, are available from the L.I.A., 420 Lexington Ave., New York 17, at $1.00 a copy; quantity discounts to educational institutions.


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*Derzavis, J. L.; Rice, J. S., and Leland, L. S.: Topical Bacitracin Therapy of Pyogenic Dermatoses; a Clinical Report, J.A.M.A. *141*:191 (Sept. 17) 1949.

*C.S.C. Pharmaceuticals*

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## New X-Ray Equipment

A NEW TYPE of x-ray equipment that will permit the taking of stomach x-rays has been installed in the offices of the Du Pont Company's Medical Division at Wilmington, Delaware. DR. G. H. GEHRMAN, Medical Director, said the new machine represents one of the most recent advances in diagnostic equipment, and is one of only a few such machines now in operation in the country. The original was developed at The Johns Hopkins University in Baltimore, where it has been in use for some time. "As far as we know we are the first company to install this equipment for the benefit of employees," DR. GEHRMANN said. "This is a further step in our program for providing Du Pont employees with a well-rounded program of periodical examinations and check-ups. The new machine is being used

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to detect stomach ulcers and, most importantly, early stomach cancer. The method is not final in establishing diagnosis, and further investigation is sometimes necessary. Cancer of the stomach, if diagnosed at an early stage, can be removed by surgery with a high chance of complete cure. It can be detected by x-ray examination before there are any significant symptoms and before the individual knows there is anything wrong with him." The new machine takes a series of six pictures with a specially designed Schmidt-type camera. It was developed by Dr. Russell Morgan and Dr. John F. Roach, of the Department of Radiology at Johns Hopkins, for making mass surveys and was installed at Du Pont under their direction. All films taken in the Du Pont medical offices will be sent to them for interpretation and report. "The new equipment will be used principally in connection with annual physical examinations," DR. GEHRMANN stated. "Chest x-rays have been a standard part of periodic examinations for 20 years, as have eye and hearing tests, blood counts, and blood and urine analyses. We also do cancer tests for women 35 or over, and electrocardiographs for men and women over 40, or when symptoms indicate the need for these examinations." DR. GEHRMANN pointed out that all of these examinations, including the x-ray, are made only with the consent of the employee. Prior to the development of this camera, doc-

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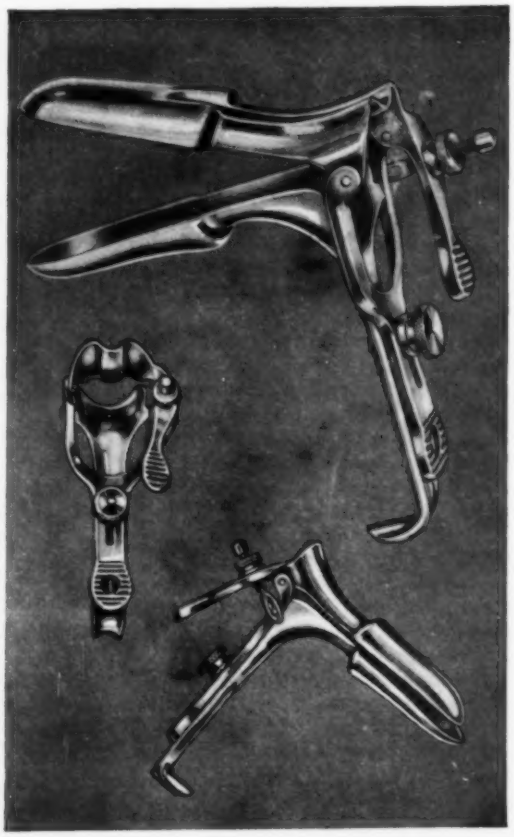

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tors were handicapped in attempting to take such a series of x-ray pictures of an individual by the danger of exposing the patient to too much radiation. The new machine surmounts this problem by decreasing the amount of radiation required to well within tolerance limits. The heart of the machine is a photoelectric cell timing device which measures the intensity of fluorescence produced by the x-rays and automatically adjusts the exposure time of the film. The "thickness" of the patient determines the length of exposure.

—E. I. du Pont de Nemours and Company, June, 1950.

## Blood in Burns

ONE of the most revolutionary changes in medical practice brought about by the new knowledge of blood is the treatment of burns. No longer does the physician treat only the wound of the badly burned patient; he treats the whole body. The major medicine is blood, although penicillin and similar drugs may also be used. Except for application of vaseline-impregnated pressure bandages, the burned surface is left alone and all effort is directed toward building up the body to withstand the shock and toxemias which follow burns—and which are responsible for 65% to 75% of the deaths. For the initial shock, plasma is usually transfused—then whole blood to repair damage to the red cells. Frequently extensive injections of serum albumin, another blood fraction, are given and when the patient reaches the stage of skin-grafting, two other blood fractions, fibrinogen and thrombin, are brought into play. In many places where suturing is difficult such as between fingers and toes or under arms and knees, skin grafts may be glued on with fibrinogen and thrombin. Today the surgeon sprays the raw surface with fibrinogen, dips the graft into thrombin, and plasters it on the wound.

—From "Blood as a Medicine," by ALMA GAINES RAMSEY, American National Red Cross, in *Med. Women's J.*, March, 1950.

## Government Has No Money

SOMEHOW it has to be pointed out that "the government" has no money. It has no resources excepting those derived from the citizens to whom it purports to give free benefits. It has, in a word, taxes—and nothing else—with which to accomplish its open-handed largesse. Those taxes come from the hide of everybody. There aren't nearly enough rich individuals or corporations to make up the gigantic sums necessary to keep our fabulous dream world going. It takes everybody—right down to the humblest laborer—to feed the giant maw of the government. That's the bitter truth that needs to be gotten across. The idea is abroad that taxes for all this come from the big businesses of the nation. Somehow it must be borne in upon Mr. Average Citizen that he is *himself* footing the bill.

—From the Address of LAWRENCE B. SIZER, Vice-President, Marshall Field & Co., at the 35th Annual Meeting, A.A.I.P. & S., Chicago, April 27, 1950.


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*Schwartz, L., et al; Industrial Medicine, 18:6, 257-258, June, 1949.

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[1]Schwartz, E.: Ann. Allergy 7:770 (Nov.-Dec.) 1949.

*From "Diseases of the Skin," by O. Ormsby and H. Montgomery, courtesy of Lea & Febiger, Phila., Pa., 1945.

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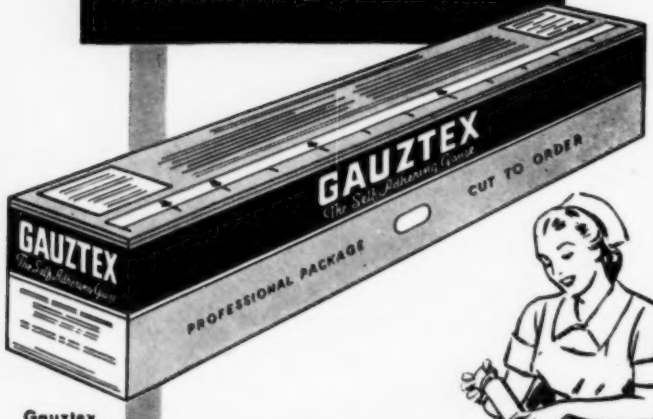


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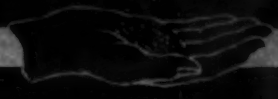

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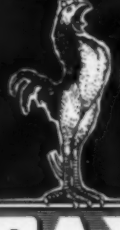

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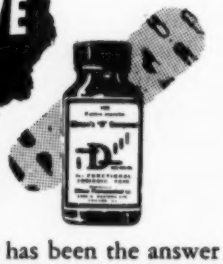

HILLMAN'S 'D' COMPOUND has been the answer to this perplexing problem which confronts every Industrial Physician.

In industry today the most common cause of female absenteeism is Dysmenorrhea. HILLMAN'S 'D' COMPOUND, through its relaxing effect of the contained ephedrine upon the uterine smooth muscle helps to favor normal flow and give women employees happier, more comfortable, more productive hours.

A generous trial supply will quickly be sent to you for your first aid room.

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Please send FREE samples D Compound for our trial
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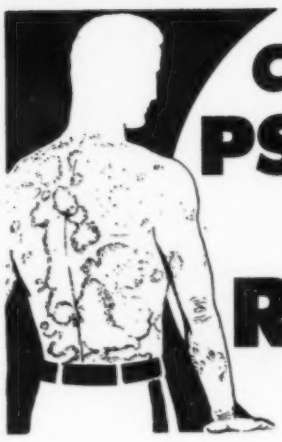


# Clear up PSORIASIS with RIASOL

The remissions of psoriasis are greatest in the summer and 60% of cases show a recession of cutaneous lesions at this season. For this reason it is important to follow-up treatment vigorously and clear up the skin patches before the cold weather sets in.

RIASOL is the ethical formula recommended for psoriasis—nothing else. Thousands of prescriptions from dermatologists and general practitioners are the best proof of its therapeutic value.

Visual proof is found in gradual fading of the red patches and disappearance of the silvery scales in 76% of cases treated with RIASOL.

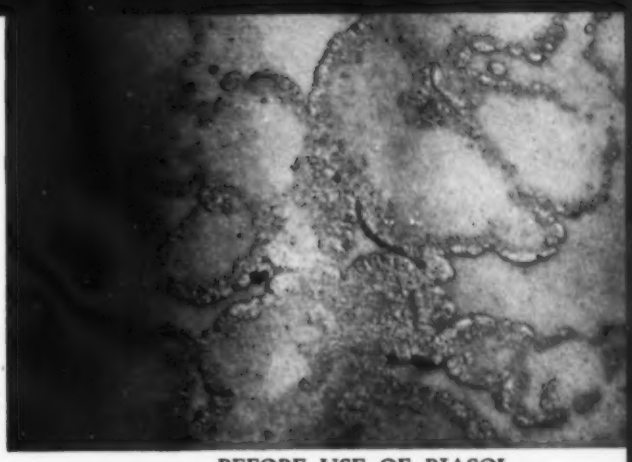
RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages necessary. After one week, adjust to patient's progress.

RIASOL is ethically promoted. Supplied in 4 and 8 fld. oz. bottles at pharmacies or direct.

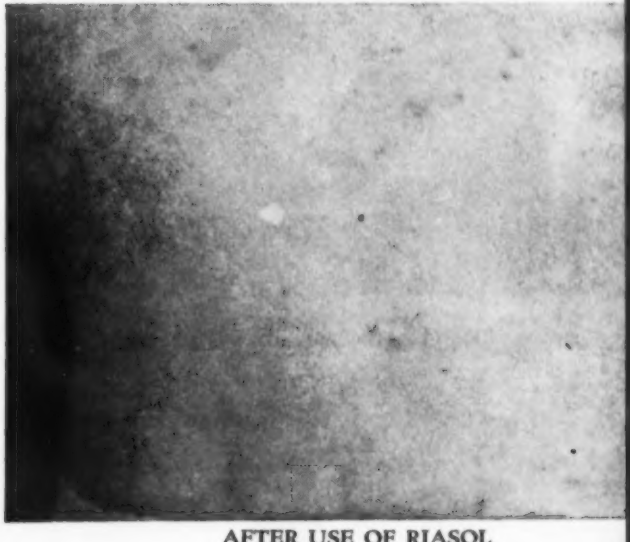
Mail coupon today for your free clinical package. Prove RIASOL in your own practice.

**MAIL THIS COUPON TODAY AND TRY RIASOL ON YOUR NEXT PSORIATIC CASE**



BEFORE USE OF RIASOL

DURING USE OF RIASOL



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**RIASOL for PSORIASIS**

# *A Real American Breakfast*

That a nutritious breakfast providing generous amounts of high quality protein prevents late morning hypoglycemia has been amply demonstrated. As shown by Thorn and co-workers,[1] and later confirmed by Orent-Keiles,[2] ". . . breakfast high in protein and low in fat and carbohydrate was followed by an improved sense of well-being and no symptoms of hypoglycemia."

Breakfast meats—ham, sausage, bacon, breakfast steaks—are an appetizing means of increasing the protein content of the morning meal. Their biologically complete protein contains all essential amino acids, and serves well in complementing less complete proteins from other sources. Furthermore, muscle meat is an outstanding source of B complex vitamins and of iron.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

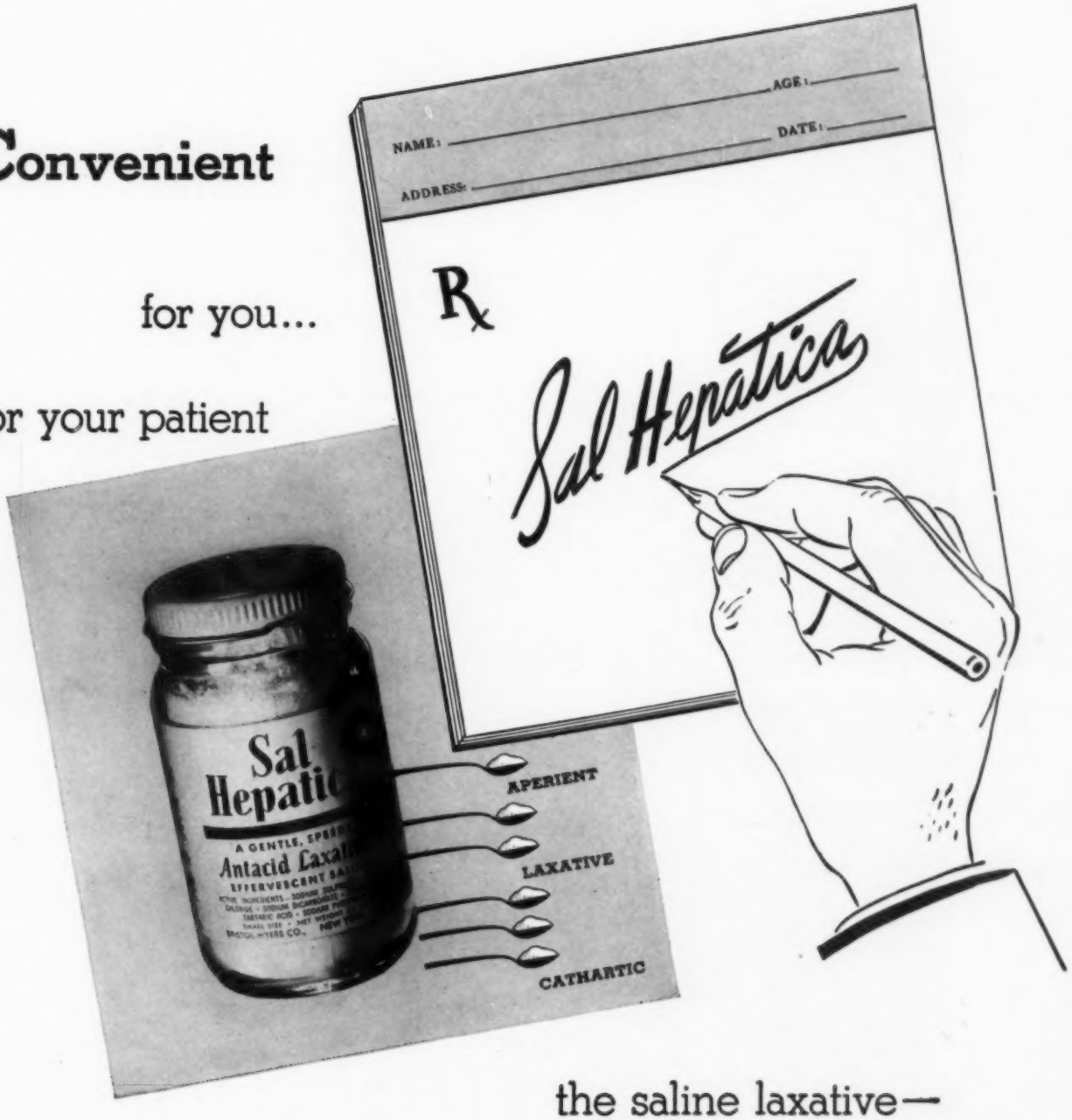
(1) Thorn, G.W.; Quinby, J.T., and Marshall, C., Jr., Ann. Int. Med. 18:913 (June) 1943.
(2) Orent-Keiles, E., and Hallman, L.F., Circular No. 827, United States Department of Agriculture, Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, Dec., 1949.

**American Meat Institute**
**Main Office, Chicago . . . Members Throughout the United States**

# Convenient

for you...

for your patient




## the saline laxative—

Whether your patient needs a laxative, or an aperient, or a cathartic you'll find it more convenient to write SAL HEPATICA on your prescription pad. No need to specify all the ingredients of three separate formulas, just prescribe SAL HEPATICA and indicate the dosage.

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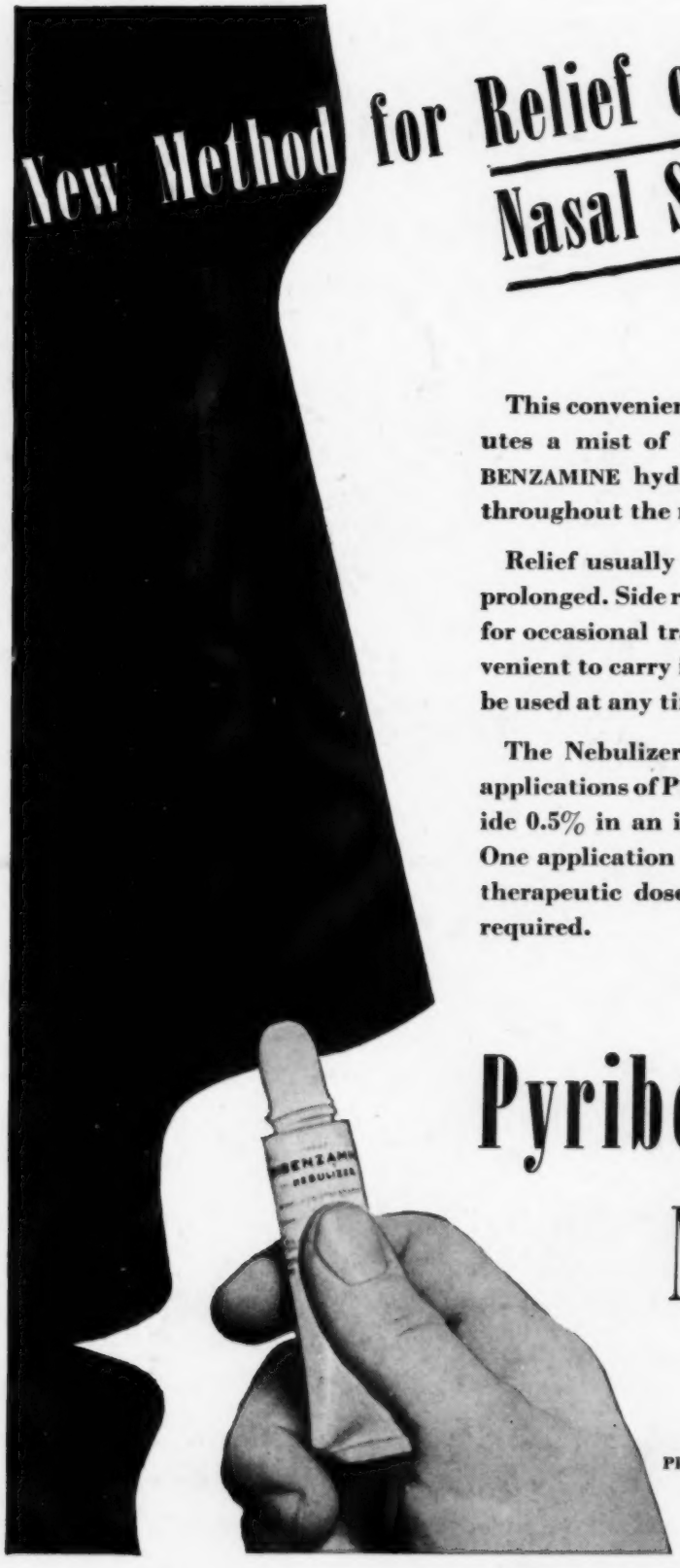
*a product of* **BRISTOL-MYERS** • **19 West 50 Street, New York 20, N. Y.**

# New Method for Relief of Allergic Nasal Symptoms



**This convenient plastic Nebulizer distributes a mist of minute droplets of PYRIBENZAMINE hydrochloride Nasal Solution throughout the nasal passages.**

**Relief usually is immediate—complete—prolonged. Side reactions rarely occur except for occasional transient stinging. It is convenient to carry in purse or pocket and may be used at any time in any place.**

**The Nebulizer provides several hundred applications of PYRIBENZAMINE hydrochloride 0.5% in an isotonic, buffered solution. One application in each nostril usually is a therapeutic dose and may be repeated as required.**

# Pyribenzamine Nebulizer

**Ciba**

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